

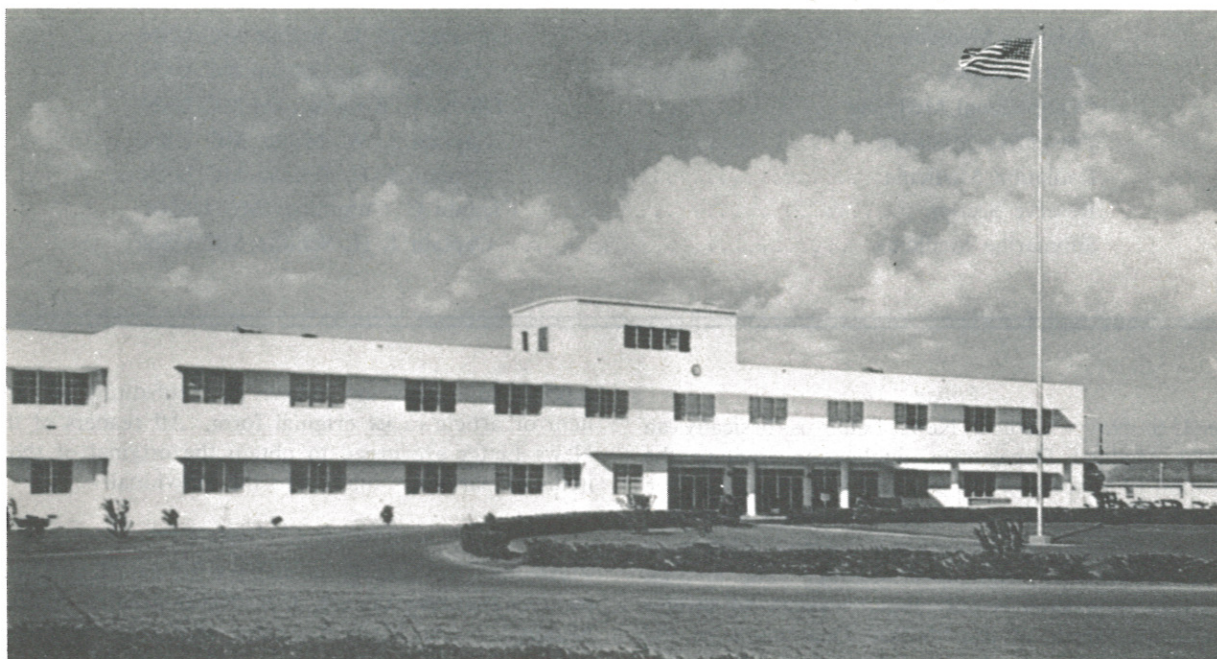
# UNITED STATES NAVY

## Medical News Letter

Vol. 45

Friday, 14 May 1965

No. 9



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*United States Navy*  
**MEDICAL NEWS LETTER**

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*Policy*

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, sus-

ceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

*Change of Address*

Please forward changes of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

**FRONT COVER:** The U.S. Naval Hospital, Guantanamo Bay, Cuba had its origin as a small dispensary in 1903 when as an outcome of the Spanish-American War, the United States acquired the use of the Bay and surrounding land area for a coaling station.

With the gradual evolution of the station to a Naval Base, the medical facilities were expanded and moved to Administration Hill.

After reaching a bed capacity of 150 the dispensary status was changed and the U.S. Naval Hospital, Guantanamo Bay, Cuba, was commissioned on 1 June 1946.

Because of the fire hazard, excessive maintenance costs, and deteriorating condition of the many small wooden frame buildings it was found necessary to construct a new hospital to meet the needs of the fleet and base population.

In 1954 Congress authorized construction of a 100 bed hospital with additional quarters for nurses and barracks for corpsmen. Following ground-breaking ceremonies on 11 January 1955 construction was completed and dedication ceremonies were held on 24 September 1956.

Built of reinforced concrete, this was the first naval hospital to be fully air conditioned. Its modern architecture and its location on a 13 acre bluff overlooking the bay make it one of our most attractive naval hospitals.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

U.S. NAVY MEDICAL NEWS LETTER



## FEATURE ARTICLE

### "WHAT'S NEW IN THE MANAGEMENT OF TRAUMA"

#### VASODILATORS AND SHOCK

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The clinical manifestations of shock have been familiar to physicians for over 100 years, and during this period of time, continued efforts have been made to elucidate the basic pathophysiologic alterations associated with the shock syndrome. This work has been hampered by the fact that experimental and clinical shock can result from a variety of causes and that, until recently, there were few controlled studies of shock in man. Nevertheless, it is now generally agreed that impaired cellular perfusion secondary to intense vasoconstriction and altered organ blood flow is characteristic of the shock state regardless of the etiology. It seems clear, also, that the vasoconstriction is due, at least in part, to marked over-activity of the adrenergic nervous system. In addition, it appears probable that whether or not the state of shock can be reversed with appropriate therapy depends upon the degree of metabolic derangement which has been produced by the impaired cellular perfusion.

As pointed out in a recent review,<sup>1</sup> many investigators have observed that when active vasoconstriction was blocked there was a significant increase in the survival of experimental animals subjected to shock. The protection afforded by limiting vasoconstriction was found to be similar whether the animals were subjected to hemorrhagic, traumatic or endotoxin shock. Further, the degree of shock protection was similar whether the sympathetic block was produced by the direct acting vasodilator drugs, sympathectomy, or adrenergic and ganglionic blockade. It was significant, also, that the protection afforded by the various adrenergic-blocking techniques employed did not seem to be of value in acute hemorrhage or trauma. In these "acute conditions" the only therapy required was prompt replacement of the vol-

ume deficit of blood and other fluid. Although little is known about the precise physiologic mechanisms by which adrenergic blockade alters the course of shock, it has been suggested by Nickerson that two important effects are most likely involved. These effects are an alteration of fluid exchange between the intravascular and extracellular compartments and a redistribution of local blood flow. Support for such effects are found in the observations that blockade of vasomotor activity has been shown to be followed by a prompt rise in plasma volume, and prevents the shift of blood to metabolically less active areas, such as the splanchnic bed during the development of shock<sup>1</sup>. Although these experimental concepts have yet to be completely clarified and quantitative in patients, they have served as a basis for the limited application of adrenergic blockade in the treatment of clinical shock of varying etiologies<sup>1</sup>. In addition, they have prompted an evaluation of the possible benefits of sympathetic blockade of surgical patients in which reduced tissue perfusion was anticipated<sup>3</sup>.

The sympatholytic effects of two types of drugs have received the most widespread clinical application in shock. These are phenoxybenzamine (Dibenzylamine), and the adrenal steroids. Of the adrenal steroids, hydrocortisone (Solu-Cortef) has been used most extensively. Each of these drugs has been used as an adjunct to the treatment of established shock which had not responded to the administration of blood or blood substitutes. Phenoxybenzamine was used in a maximal dose of 1.0 mg./Kg, administered intravenously at a rate slow enough so as not to produce an abrupt fall in the systemic arterial pressure. The time required to administer the total dose of drug was as long as 24 hours<sup>1,2</sup>. The

dose of hydrocortisone utilized was 15-25 mg./Kg, administered intravenously during the first 24 hours of treatment. The incidence of further hypotension with hydrocortisone has been reported as being minimal<sup>3</sup>. One drug, phenoxybenzamine, has received limited use in the pretreatment of surgical patients undergoing corrective cardiac operations utilizing extracorporeal circulation. Doses ranging between 0.5 and 1.0 mg./Kg have been administered intravenously in order to induce a sympathetic block prior to the start of cardiopulmonary bypass<sup>3</sup>.

In each of these clinical circumstances the anti-adrenergic drug was administered only after a critical evaluation of the patient's blood volume and appropriate replacement of blood and/or intravenous fluid. In every patient in which either phenoxybenzamine or hydrocortisone was used there were continuous measurements of the systemic arterial and venous pressures in addition to careful evaluation of the urinary output and blood electrolyte alterations.

As the result of his experience using phenoxybenzamine in the treatment of human shock,<sup>2,4</sup> Nickerson has reported the following conclusions: 1. Rapid and adequate circulatory volume replacement was the only therapy required in most cases of early shock; 2. The rapidity and magnitude of the hypotensive response to the blocking agent was a reliable indication of the adequacy of the circulating blood volume, and the volume of fluid required to restore blood pressure gives a semiquantitative measure of any deficit; 3. Low blood pressure values were well tolerated providing vasoconstriction was prevented and adequate venous return maintained; 4. Severe shock can occur at normal or elevated blood pressures; 5. Some individuals who failed to show a sustained improvement following one or more large transfusions were observed to do so after the blocking agent was administered; 6. In patients with inadequate myocardial function the administration of phenoxybenzamine permitted an increase in the rate of administration and in the total volume of fluid which could be tolerated without pulmonary congestion; 7. In many patients an improved level of

renal function parallel to the improved cardiovascular status was observed following adrenergic blockade; 8. In prolonged shock, the incidence of an improved renal response was less than the incidence of cardiovascular improvement; 9. There was no indication for anti-adrenergic blockade in hypotensive patients who do not exhibit clinical signs of peripheral vasoconstriction and an increased level of sympathetic nervous system tone; and 10. There were no obvious differences noted between the responses of patients in shock due to hemorrhage, trauma or infection or between groups which were in shock for varying periods of time. Lillehi and associates have reported similar beneficial results from their experience using the adrenal steroids as adjuncts to shock therapy<sup>3</sup>. In addition, these investigators have concluded from observations of surgical patients in which phenoxybenzamine pretreatment was used prior to starting bypass that: 1. The drug induced adrenergic blockade permits better perfusion; 2. Blood replacement following bypass is facilitated since, under these circumstances, low arterial pressure means low blood volume; and 3. The phenoxybenzamine block may permit more adequate urinary output during bypass and during the postoperative period.

It seems clear from the results of the various carefully conducted experimental studies in laboratory animals and man that an interruption of sympathetic vasomotor activity may be beneficial in preventing cellular derangements secondary to impaired cellular perfusion. The effects of this type of therapy, as well as, a precise definition of shock in terms of cellular metabolism await clarification.

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## MEDICAL ARTICLE

### CORONARY CARE UNIT (1)

#### A SPECIALIZED INTENSIVE CARE UNIT FOR ACUTE MYOCARDIAL INFARCTION

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The mortality from coronary heart disease in this country exceeds half a million a year, making it the greatest single cause of death. Despite considerable advances in our knowledge concerning the pathophysiology and risk factors of coronary atherosclerosis and vast improvement in the diagnosis and management of this disease, there has been, as yet, no effective and satisfactory program to reduce significantly the mortality rate.

#### Need for a Coronary Care Unit

Eighty-five per cent of the deaths from myocardial infarction occur within the first week of the attack. The vast majority of these deaths result from cardiac arrhythmia, cardiogenic shock, or cardiac failure, alone or in combination. Rapidly accumulating experience indicates that prompt and effective treatment in the hospital will significantly reduce this mortality, particularly if the potentially lethal cardiac arrhythmias (ventricular fibrillation, tachycardia and asystole) are promptly detected, diagnosed, and

treated by the application of modern techniques, assisted by a competent staff. This requires continual attention and instantaneous action. It is therefore suggested that, for the first few days, patients with myocardial infarction, known or suspected, be provided with constant and intensive care in order to facilitate early detection of complications and prompt, effective treatment.

#### Recent Clinical Reports

Recent studies in several hospitals suggest that a Coronary Care Unit may significantly improve therapy and reduce mortality in this disease. Up to December, 1964, several groups of workers have reported in the literature, or in unpublished data available to us, various major types of cardiac arrhythmias and conduction defects observed in patients with acute myocardial infarction by continuous monitoring in special coronary care areas. Although information is not entirely uniform or complete, the figures presented in table 1 show that the over-all incidence is approximately 70%. Furthermore, in one patient two or more types of cardiac arrhythmias and/or conduction defects may be observed.

\* From the Council on Clinical Cardiology of the American Heart Association, New York, New York, and the Heart Disease Control Program, Division of Chronic Diseases, U.S. Public Health Service, Washington, District of Columbia.

**TABLE 1**  
**INCIDENCE OF CARDIAC ARRHYTHMIAS AND CONDUCTION DEFECTS IN ACUTE MYOCARDIAL INFARCTION DETECTED BY CONTINUOUS MONITORING**

Authors:	Spann	Robinson	Julian	Brown	Meltzer	Day
Number of patients	30	36	100	100	141	155
Duration of monitoring	Up to four days	Until free of chest pain for 72 hours	Up to five days, or longer	Up to two weeks	72 hours	Up to 12 days
Incidence of all types of arrhythmias (%)	73	75	95	61	71	60
Major types*						
1. Atrial or supraventricular tachycardia	1	2	4		12	
2. Atrial flutter		1	2		3	
3. Atrial fibrillation	3	5	16	10	12	15
4. Multiple ventricular premature beats	9	12	67	40	40	
5. Ventricular tachycardia	11	3	6	11	19	14
6. Ventricular fibrillation		3	10		6	11
7. Ventricular asystole		7			4	10
8. 1° or 2° A-V block	2	12	23		19	
9. Complete A-V block			8		8	4
10. Bundle-branch block	5		13		31	11

\* Patients who had more than one major type of cardiac arrhythmia were also included for analysis.

Nevertheless, it is apparent that continuous monitoring may uncover important cardiac arrhythmias which would otherwise escape detection, and that the incidence observed by these workers is considerably greater than that reported in previous studies of a similar nature in which no continuous monitoring was employed. This emphasizes the importance of early and immediate recognition of cardiac arrhythmias, making possible prompt intervention and treatment which may save many lives.

Dr. Day of Bethany Hospital, Kansas City, Kansas, and Dr. Meltzer of Presbyterian Hospital, Philadelphia, Pennsylvania, have kindly transmitted to us for our review their latest reports in regard to the number, major complications, types of cardiac arrhythmias, and survival rate of the patients with acute myocardial infarction in their respective Coronary Care Units. Because of the relatively small number of patients studied, it is not yet feasible to submit the clinical data for statistical comparison. The results so far, however, have indicated a favorable trend toward reduced mortality when patients with acute myocardial infarction are constantly observed and their complications promptly treated in a Coronary Care Unit.

#### Organization of a Coronary Care Unit

It should be emphasized that the following suggestions and recommendations concerning criteria for personnel, physical design and construction, and

equipment are based on limited experience. Furthermore, usefulness of information and reliability of equipment are subject to further study. In the future, some of the items mentioned may be replaced by superior equipment or become unnecessary.

The establishment, performance, and success of a Coronary Care Unit depend upon three important factors: personnel requirements, physical design and structural needs, and instrumental equipment.

#### Personnel Requirements

The key to the successful operation of a Coronary Care Unit is staffing the unit with a group of specially motivated, trained, and dedicated physicians and nurses who are responsible for the care of the patients with acute myocardial infarction.

*Unit Director:* The unit should be organized under the direction of a cardiologist or a small group of physicians. Prior to the opening of a unit, a policy statement by the administrator of the hospital and the chairmen of the appropriate departments should clarify and delineate the authority of the director or responsible physician of the unit in determining policies of admission, length of stay, discharge of the patients, and other operational problems and procedures.

*Physicians:* House officers (interns and assistant residents) may rotate through the unit for a specific period, and at least one physician should be on duty at all times. The house officers should receive contin-



uing education and training in the newer techniques and knowledge of the diagnosis, prevention, and treatment of cardiac arrhythmias, cardiogenic shock, cardiac failure, and other complications which may occur in acute myocardial infarction. The assignment, function, and responsibility of the attending physician in relation to the unit may vary from one hospital to another, but should be definitely stated in writing. In some hospitals, where there are relatively few or no house officers, special arrangements have to be made to ensure full coverage by experienced physicians around the clock.

It may be advisable to set up a special committee on Coronary Care Units in a given hospital. This committee would see that the best procedures are used, adequate staff provided, and an educational program carried out for all physicians connected with the hospital.

*Nurses:* Nurses staffing a Coronary Care Unit play a key role in its proper function. The nurse will frequently be the first professional person to recognize and initiate treatment for a complication, such as cardiac arrest. The selection of nursing staff should be based upon skills, interest, motivation, and initiative. However, opportunity should be provided for other nurses in the hospital to rotate periodically through the unit. The hospital should attempt to provide special recognition for the nurses working in this unit, possibly including higher salaries and more free time than are customary for less demanding services. A program of continuing education should be instituted and encouraged. A special course of instruction should be given for all nurses working in the unit. The course should encompass at least the following:

1. Instruction in anatomy, physiology, and pathology related to coronary heart disease.
2. Clinical features and complications of acute myocardial infarction.
3. Electrocardiography, especially the pattern recognition of cardiac arrhythmias.
4. Fundamentals, operation, and limitation of electronic equipment.
5. Special care of patients in Coronary Care Units.
6. Principles and practice of cardiac resuscitation, including use of pacemakers and defibrillation, and depending on local policies and immediate availability of experienced physicians.

#### Physical Design and Structural Needs

In order to achieve constant and intensive observation of patients with acute myocardial infarction

and to provide immediate emergency treatment potentially lethal complications, the following criteria of physical design and facilities of the Coronary Care Unit should be taken into consideration:

#### *Physical Design*

1. The unit should be established as a separate area within a hospital and situated as near the emergency department or a general medical ward as possible. Adequate transportation facilities for rapid mobilization of proper personnel and equipment must be provided.

2. The functional or structural form of a unit may be a circle, semicircle, or tangential variant (hexagon or octagon) with fixed, movable, or curtain partitions, and relative privacy for each patient. It should provide an attractive and noninstitutional atmosphere for both professional staff and patients. Special provisions should be made for the removal of deceased patients with minimal disturbance and inconvenience.

3. The unit should be constructed so that direct observation of all patients is possible from a central nursing station and working area. The distance from the nursing station to the patients' beds should be relatively short; an adequate open area should be provided for equipment in the nursing station. Nursing care is facilitated if the alarm signals and monitors are placed so as to provide maximum audiovisual contact for staff while they are working in patient rooms, as well as at the desk.

4. The minimal floor space for a five-bed unit is estimated to be approximately 1,100 square feet. This includes separate patient areas, nursing station, storage space for equipment and medicine, utility rooms, and toilets. For each individual patient, an enclosed space of approximately 132 square feet (12 x 11) should be the minimum size. Adequate space around the patients' beds is essential to provide easy access, and movement of extra personnel and equipment.

5. Additional rooms adjacent to the unit should be provided for physicians' consultations, sleeping area, and nurses' lounge. It has been suggested that a family room should be situated at some distance from the unit in order to avoid unnecessary interference and visits. At least two chairs for each coronary bed seem desirable.

#### *Structural needs*

It is suggested that the following items be considered and included as prerequisites in construction:

1. Electrical isolation to minimize the problem of interference in electronic monitoring.

2. Sound-proof structure with acoustical tile ceiling and conductive floor tiles laid over grounded copper.

3. Adequate lighting for routine and emergency examination (two 300-watt lights—one spot and one flood—at the head of each bed).

4. Proper air-conditioning to control temperature and humidity.

5. Well-planned intercommunication, signal, and alarm systems, including:

Patients to nurses' station.

Nurses' station to family waiting room, nurses' lounge and physicians' room.

Nurses' station to page operator, or linking to page system.

Central alarm button at nurses' desk to alert appropriate physicians.

It should be emphasized that monitoring is useless unless there are good communication and signal systems in the unit.

6. Adequate electrical circuits (including appropriate redundancy) with a number of duplex 110-volt receptacles for monitoring and connecting equipment and one or two 220-volt wall receptacles for portable X-ray and other high-voltage equipment. Grounding of circuits, especially in older buildings, should be thoroughly checked by electrical engineers.

7. Built-in equipment, carefully planned and installed; an adequate number of conduits to provide sufficient space for future additions to monitoring.

8. Bedside outlets for oxygen and suction; wall-bracket support.

9. Ceiling support with track and arm for intravenous therapy.

10. Night light at entrance to each room.

11. Locked medicine cabinets and dispensing shelf.

12. Adjustable hospital bed.

13. Any transformer for special equipment placed as remotely from the unit as possible.

## MANAGEMENT OF UNDERWATER ACCIDENTS

John B. Weeth, M.D.

The growing popularity of underwater swimming has brought with it an increasing incidence of underwater accidents. Any physician who lives near water more than 30 feet deep may be suddenly faced with the problem of diagnosis and management of an underwater accident. Injuries from spear-guns or propeller blades present no diagnostic problem. Similarly, most physicians have no difficulty recognizing and using appropriate medications to counteract fish poisons and stings. The enigma for many physicians is the patient whose injury is related to gas or pressure phenomenon, popularly known as "the bends." Despite a number of excellent reviews of underwater swimming accidents, some with outstanding illustrations,<sup>1-6</sup> including the authoritative and comprehensive *US Navy Diving Manual*,<sup>7</sup> most physicians are not familiar with the management of these casualties. It seems desirable, therefore, to review the management of underwater accidents and to cite illustrative cases.

Drowning is still the major cause of deaths from underwater accidents. Butterfield and associates<sup>8</sup> reported that in nine of 15 reported diving deaths in Massachusetts the victim perished on the surface

after the face mask either had filled with water or was lost. Taylor and coauthors<sup>9</sup> reported that 14 of 24 deaths in Florida could have been prevented by safety lines and proper use. These are sad reminders that the diver's life depends on knowledge and training and that the physician's treatment for underwater accidents is to a great extent preventive.

Both physicians and laymen who have any responsibility for underwater swimmers should acquire a copy of the *US Navy Diving Manual*. It contains all the information and diving tables that are required, is easy to read, and covers both principals and practice. Its military and medical tone impress both the novice and the self-styled expert with the serious implications of swimming and diving.

The physician who sees a patient thought to be a victim of the bends should consider five general possibilities: (1) suction and blast injuries, (2) gas-expansion injuries, (3) decompression sickness (gas bubbles), (4) gas-poisoning residuals, and (5) emotional reactions (panic, etc.).

### Underwater Accidents

*Suction and Blast Injuries.* Underwater suction injury is called "squeeze" and results from inequality of pressure. We all experience a mild type of squeeze

From the Division of Research, Alton Ochsner Medical Foundation, and the Department of Medicine, Ochsner Clinic, New Orleans.  
Reprint requests to 1520 Jefferson Highway, New Orleans 70120 (Dr. Weeth).



on our eardrums when riding in an elevator if we have a momentary failure to equalize middle-ear pressure. Pressure changes in water are much greater in magnitude, equaling about 1 lb/sq in of added pressure for every 2¼-foot descent. Thus, middle-ear pressure must be equalized rapidly during any descent or there will be massive hemorrhage in the middle ear to flood the compartment and equalize pressures by hydraulic means. The physician examining the ear can see the hematoma behind the drum.

*Case 1.*—A 35-year-old diver was pulled by the current from a pipe to which he was clinging and fell rapidly from a depth of 65 to 80 feet. He was unable to clear one ear, and a massive hemorrhage in the middle ear and rupture of the eardrum resulted.

Most of these injuries heal well, but they are potentially lethal. Should injury of flooding result in enough vestibular stimulation to cause vomiting in a face mask or whirling loss of orientation, drowning is possible.

Hemoptysis and pulmonary edema may occur in a second squeeze situation. If a surface diver descends too deeply, fluid and blood may be squeezed from his lungs if his surface lung volume is compressed below his residual air volume. Faulty breathing regulators with extremely high inspiratory resistance may create a pulmonary intermittent suction situation as the diver tries to suck air. Linaweaver<sup>10</sup> observed patchy pulmonary infiltrates from this cause in some patients.

A serious type of squeeze may occur when using a face mask, helmet, or suit being supplied with air from the surface. Should the air hose blow loose or pressure fail suddenly, and the mask is not equipped with a properly working nonreturn valve, the face mask or helmet will instantly be converted into a giant suction cup and pull the face of the diver up into it.

*Case 2.*—A hose blew off the surface supply tank while a diver was working at a depth of 50 feet. The nonreturn valve on his face mask failed to function. He instantly lost pressure from his face mask and was unable to rip it off. Massive bruising of the facial tissues resulted. Fortunately, despite intense scleral hemorrhages, the vital structures and integrity of the eyes were preserved, and he recovered without permanent residual injury.

If a diving suit is worn, folds of skin may be forced into the creases, resulting in serpentine ridges of bruising. If confused with cutaneous manifesta-

tions of the bends, unnecessary treatment could result.

To treat underwater blast casualties the physician must understand the mechanism of injury. The force of any blast will be transmitted through solid and liquid media and is diminished only by the distance. A blast force can obviously cause concussion of the brain or injury to the eardrum. Less obvious, but life-threatening, is the fact that as a sufficiently strong explosive force crosses a solid or liquid-to-gas interface, there is a shredding effect into the area of the gas. The familiar water spray shooting into the air from the depth charge is a classic illustration of this effect. Therefore, in blast victims one must look for pulmonary and gastrointestinal hemorrhage and rupture of abdominal hollow viscera. The patient should be observed carefully for a sufficient period of time to ensure that significant pulmonary or visceral injury has not occurred.

*Case 3.*—A 29-year-old diver was working in 105 feet of water using a cutting torch. Ignition of welding and marsh gases in a pipe resulted in an explosion which reportedly knocked dishes off shelves on the oil rig above. The patient received adequate decompression on the surface to forestall development of bends before being brought to Ochsner Foundation Hospital, New Orleans. On admission, both eardrums were hemorrhagic and there was drainage from the left ear. No abnormalities were detected on roentgenography of the chest and there were no indications of free air under the diaphragm. The hemoglobin level was 15 gm/100 ml and the white blood cell count was 17,850/cu mm with a shift to the left. The patient coughed frequently and had temperature spikes to 102 F (38.9 C) during the first two days. By the fifth hospital day fever had subsided and the patient was discharged for outpatient observation.

*Gas-Expansion Injuries.* The second type of injury is caused by the large volume expansion of gases during ascent of depressurization. Air embolism, which is usually fatal is most likely to occur when the victim surfaces rapidly and does not vent the expanding air from his lungs properly. As the trapped air expands, it enters the arterial circulation through the pulmonary veins and fatal doses of air go throughout the body. At least one fatal case has occurred recently in New Orleans. A victim of air embolism surfaces, gasps, and then sinks back beneath the water. The accident usually occurs at the moment of surfacing. At necropsy, air bubbles may be found throughout the tissues. Should a victim survive the initial episode, he must be immediately

repressurized to a 165-foot depth and treated according to USN treatment tables.<sup>7</sup>

Air in the lungs, at a depth of 33 feet, will double in volume by the time the subject has reached the surface, and therefore air equivalent to one total lung volume will have to be blown off in the last 33 feet of ascent. The potential hazards in such a situation are obvious. Air embolism can be prevented by thorough training and familiarity with equipment. The diver who does not have to ditch useless breathing gear and head for the surface in a panic will not be exposed to the danger of air embolism.

Even if fatal air embolism does not occur, the expanding air can cause other problems.

*Case 4.*—A 28-year-old diver was working in 110 feet of water when a cable pulled his mask off. He made a free ascent to the surface and seemed to exhale the excess air reasonably well. Epigastric pain developed two or three minutes after surfacing. Recompression in a chamber failed to relieve the pain significantly. He consulted the author four days later because of increased pain. On examination considerable epigastric tenderness and splinting were apparent in a stoic individual. It was the initial impression that expanding air had overdistended the stomach. Two days later discomfort became more pronounced and he was admitted to Ochsner Foundation Hospital for observation by a surgical consultant as well. No evidence of perforated viscus was demonstrated roentgenographically. The pain subsided two days later and he was discharged from the hospital.

*Decompression Sickness.* Decompression sickness, which is also known as caisson disease, is a more accurate term than "the bends." The latter has the popular connotation of any injury sustained in the water. Decompression sickness occurs when the diver stays deep enough and long enough to force nitrogen from the air into physical solution in his blood and body tissues so that if he surfaces too rapidly the nitrogen will precipitate in the tissues and vascular bed as nitrogen bubbles. Both sufficient pressure and time are essential. A diver may safely stay at a 60-foot depth for one hour, but only half an hour at a 90-foot depth without having to decompress. The "no-decompression" intervals become even shorter as the depth increases. When tissue nitrogen saturation has exceeded a certain amount, the diver must come up slowly enough to allow the nitrogen to be breathed off to prevent precipitation of actual bubbles in the tissues and blood. Classic decompression sickness is due to nitrogen bubbles from the air, but with appropriate pressure and time, decompression

sickness could occur from other gases as well. The exact method of bubble formation is not known, but carbon dioxide, muscular tension, and work are considered important precipitating factors for bubble formation.<sup>11-13</sup>

The best treatment for bubble formation is prevention. The Navy treatment tables are internationally respected and should be followed exactly as written. It should be understood by the physician, however, that symptoms of bubble formation can occur in spite of seeming rigid adherence to the diving tables. Errors in measurement of depth-pressure ratios, failure to take into account previous repetitive dives, and fatigue have been the most frequent causes of symptoms here, even when "the tables have been followed exactly."

When prevention has failed and bubbles occur, transport the patient to the nearest recompression chamber and treat him according to the Navy treatment tables.<sup>7</sup> Rivera<sup>14</sup> analyzed 935 cases of decompression sickness on file at the Experimental Diving Unit in Washington, DC, from 1946 to 1961. He concluded that the use of the Navy treatment tables, based on use of pressure greater than required for the relief of symptoms, is the best approach.

These tables have two symptomatic sections. If the patient has "pain only," he is recompressed from 6½ to 11 hours. Use of 100% oxygen can cut treatment time down to 2½ to 4 hours, respectively. For all other more "serious symptoms," 19 or 38 hours in the recompression chamber are necessary and oxygen use does not diminish treatment time. At this hospital delay in starting treatment has made patients with "pain only" more resistant to treatment and has ultimately required use of 19- and 38-hour therapy outlined for those with "serious symptoms."

In the Navy, divers are well motivated to report all symptoms, and less serious symptoms predominate: local articular pain 89%, dizziness 5.3% and paralysis 2.3%.<sup>7</sup> Experience at the Ochsner Medical Center has been different. Articular pains are often ignored by commercial and sport divers if the pain is tolerable. The physician is called only when pain becomes unbearable or serious symptoms such as paralysis occur. It is not surprising, therefore, that in 33 instances of decompression sickness managed under the direction of the Ochsner Medical Center, 13 men had significant central nervous system involvement. The table summarizes these cases.

Presenting symptoms of spinal cord injury have ranged from obvious, complete paraplegia, through distinct lower extremity numbness and weakness, to two instances when urinary retention was the reason



the diver came to the doctor. Inadequate or improvised therapy was given in four cases of spinal involvement, because the divers failed to recognize the serious involvement until it was too late. The mid-thoracic and sacral spinal cord seem particularly susceptible to permanent damage from even brief ischemia and other injuring factors which may be present from the bubbles of decompression sickness. Thus, even immediate recompression treatment is not always completely successful. Eight of nine men with initial spinal-cord involvement have incapacitating residual damage, including one permanent total paraplegia. Another of these men had a convulsion six months after the accident, in addition to the residual spinal-cord damage. Even delayed therapy may succeed, however, since the one complete recovery followed use of one of the Navy diving tables when spinal injury symptoms had been present for about 24 hours.

Serious initial brain involvement has had a better prognosis with two spontaneous recoveries. Each patient arrived at the Ochsner Medical Center by helicopter about three hours after their accident, and only faint residual neurological abnormalities were still detectable and these disappeared rapidly.

An important problem in recompression therapy has been the air temperature rise during the compression phase. All of the chambers used here have been outdoors. Temperatures of 110 F with 100% humidity have been recorded at the end of slow compression runs. With larger, faster compressors the initial temperature is certainly higher. Excessive temperature is an important consideration in elective treatment with high-pressure oxygen, and was the deciding factor in not treating a patient critically ill with tetanus.

Supportive therapy during recompression treatment must include copious fluids to replace the tremendous body losses of perspiration. Sedatives such as barbiturates, in doses of 0.1 gm every four hours, are occasionally necessary for the patient who becomes fretful and apprehensive, particularly in the later stages of the 19- and 38-hour therapies. Narcosis should be avoided as the patient's subjective responses and reflexes are the guides to length of recompression therapy.

*Case 5.*—A 25-year-old sport diver, spear fishing in competition, made an uncounted number of dives, going as deep as 140 feet. Within 15 minutes of surfacing from his last dive he experienced severe multiple articular pains and collapse. On arrival by helicopter at Ochsner Foundation Hospital he was ashen grey; the pulse was weak and thready, the rate

120 beats per minute. He was able to answer questions, but often interrupted to cry out with pain. He had no obvious respiratory or neurological difficulties. Nail-bed cyanosis was pronounced. It was necessary to fly another 55 minutes in the helicopter to reach a compression chamber on that particular day. Minimum safe helicopter altitude was used and no harmful effects of the flight were noted on the patient. During the compression run, the patient lost detectable vital signs and respirations became evident again only when the chamber was cooled by drenching it with hoses and releasing some of the pressure. He regained consciousness shortly and revived rapidly with oral fluids, with ultimate complete recovery.

This particular case presents the common complications of distance. Accidents treated by the Ochsner Medical Center occur as a result of the expansion of the petroleum industry into 85- to 240-foot depths of the Gulf of Mexico. Commercial and sport divers operate from or near these rigs which are 100 to 200 miles away from the Center. This difficulty has been managed by having the physician stay here in New Orleans until the facts of the injury are fully ascertained and directing the initial phases of therapy at long distance. This minimizes the possible catastrophic effects of delay in recompression treatment.

Arrangements are simultaneously made for the physician to travel to the patient. The physician should go if he possibly can, to be sure that the diagnosis is correct and that the treatment is proceeding properly. In three instances, on arrival at the accident scene, it was necessary to catheterize spinal-injured divers who were in considerable pain with urinary retention and still had more than 24 hours of recompression therapy to endure. In another instance, a convulsion had occurred while the physician was en route. Examination in the chamber confirmed that no associated injury or disease was present, which required altering the plan of treatment.

The physician should be prepared to enter the chamber, but must remember that he is exposing himself to possible ear squeeze, nitrogen narcosis, and decompression sickness. Aneroid sphygmomanometer and medications in glass containers in the emergency bag have withstood an addition of 5 atmospheres without impairment.

*Gas-Poisoning Residuals.* The effect of pressure will augment the toxicity of certain gases and cause concentrations of gases innocuous at surface pressures to become toxic. Should a compressor supply-

ing a diver below or one being used to charge air tanks have its intake too near its exhaust or a source of carbon monoxide, carbon monoxide poisoning could occur.<sup>15</sup> The partial pressure of the carbon monoxide increases with depth and reaches toxic levels sooner. Similarly, any other noxious gases will have a greater tendency to cause headache and nausea under pressure, and these will simulate symptoms of decompression sickness.

Nitrogen narcosis or "rapture of the deep" begins to be noticeable at 150 feet and may have a serious intoxicating effect, particularly on a novice, at 200 feet. Irresponsible, bizarre behavior will result, but the condition will be relieved by coming to shallower depths or the surface.

Oxygen toxicity is dangerous because a grand-mal seizure may result without warning. Oxygenrich mixtures or pure oxygen should not be used for underwater swimming. Nausea is another symptom of oxygen poisoning. A swimmer breathing pure oxygen at a depth of 30 feet for 15 minutes runs an ever-increasing risk of a grand-mal seizure with each second. This might explain why a person would be brought to the surface unconscious and exhibiting signs of postconvulsive lethargy, if he was fortunate enough to have survived drowning. When using 100% oxygen inhalation during treatment of decompression sickness, one must watch closely for signs of oxygen poisoning. No one should use oxygen instead of air without being familiar with this possibility. The exact mechanism of oxygen toxicity is not known.<sup>16-18</sup> Should oxygen poisoning occur, the high-pressure oxygen must be stopped immediately.

*Case 6.*—A 23-year-old diver was working in 170 feet of water for 30 minutes. He had to surface directly because of rough water and there was some delay in getting him into the decompression chamber on the surface. Decompression was accomplished on the appropriate schedule. About 90 minutes after decompression his arm began to hurt and kept him awake during the night. The next day a trial of decompression in the water failed to relieve him. When seen at this hospital, his pain was not severe, but it was felt that he would be made more comfortable and complications might be forestalled by adequate treatment. An oxygen-equipped decompression treatment chamber was available and treatment was undertaken according to the Navy treatment tables for "pain only." The pain was not completely relieved even when he reached 100 feet. The pain in the elbow and knee disappeared at the 140-foot level. During the ascent on the treatment table he

breathed 100% oxygen at 60 feet for 30 minutes and had no difficulty. He had been breathing oxygen for about ten minutes at the 50-foot level when he suddenly began to feel nauseated. The mask was immediately removed, but the nausea increased intensely for about another minute and then subsided just as rapidly as it had appeared. In five minutes he was able to resume the oxygen treatment schedule without difficulty. He had no symptoms on completion of treatment and has had no residual effects.

*Reactions Not Due to Gas and Pressure Changes.* Pain in the chest and joints, numbness, and other symptoms of decompression sickness may be simulated by emotional or organic medical problems, but with a number of confusing items in the history, it may be difficult to detect them. Someone swimming vigorously for a number of hours is certainly capable of having a myocardial infarction or other medical disaster. Exhaustion, fatigue, and other emotional reactions are common.

*Case 7.*—A housewife who was taking scuba-diving lessons in a swimming pool was seen because of numbness of the lower half of the body. No impairment of muscular strength or reflexes was found on examination. Upon careful questioning it was learned that the patient agreed to take lessons only to please her husband and actually was extremely frightened by the whole procedure. Symptoms subsided rapidly on reassurance.

*Case 8.*—A commercial diver complained of pain in the shoulder after repeated dives and hard work in depths which could have resulted in decompression sickness. On physical examination the pain proved to be muscular, probably due to twisting of the shoulder. Relief was obtained after appropriate measures were instituted.

### Summary

Five general types of underwater accidents due to gas and pressure exposure are discussed. Proper classification will lead to better treatment even though the physician himself is not familiar with skin diving. In an era when high-pressure (hyperbaric) environments are being discussed and used for research and treatment of various medical disorders, the casualties herein described, including ten men with permanent incapacitating injuries, serve as reminders that high-pressure environments are dangerous, accidents will occur, and the physician must know what to do in an emergency.

The *US Navy Diving Manual* is available from

the Superintendent of Documents, Government Printing Office, Washington, DC 20402, at \$3.25.

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### THE U. S. NAVY'S SUBMARINE AND DIVING MEDICINE PROGRAM

Training in the Navy's Diving Medicine Program is provided at the School of Submarine Medicine. This school convenes twice a year at the U. S. Naval Submarine Medical Center, Submarine Base, New

London, Connecticut. Each class is approximately six months in duration. The curriculum includes: Basic Submarine Training, underwater physiology, hyperbaric physiology, psychiatry, dentistry, toxicology, environmental physiology and radiobiology. Successful completion of the course is creditable toward certification by the American Board of Internal Medicine and the American Board of Preventive Medicine. Upon completion of this course of instruction, students are assigned to a tour of operational duty aboard a submarine or at a diving activity. During this tour, the student prepares a thesis and passes a comprehensive examination on submarine and diving medicine and is then designated a "Qualified Submarine Medical Officer."

After completing a tour of duty with an operational unit, the medical officer may apply for post-graduate training in various fields. He may prepare for certification in preventive medicine and obtain a graduate degree by attending one of the Schools of Public Health or Industrial Medicine. He may prepare himself for a career in research and obtain a graduate degree in diving physiology or radiobiology by attending one of the appropriate civilian universities.

Applications are accepted in the Bureau of Medicine and Surgery for the course which convenes in February and August of each year.

Further information on Submarine and Diving Medicine may be obtained by writing to: Director, Submarine and Radiation Medicine Division, Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C. 20390.

## FROM THE NOTE BOOK

### 29TH ANNUAL EDUCATIONAL CONFERENCE

The 29th Annual Educational Conference of the National Association of Sanitarians which will be held in Miami Beach, Florida June 20-24 is but a few months away. All of us should be thinking of these dates.

The Florida Association of Sanitarians, the Host Association, is working diligently to make this conference one of the outstanding ones. General Chair-

man, Charles Brettell, informs us that all committees are hard at work on the details at this early stage.

The Deauville Hotel has been selected and approved as convention headquarters. The Deauville is ideally located, (as it is situated on 65th to 67th streets and Collins avenue on the ocean, thus being in the exact heart of Miami Beach) and is but minutes from any and all of the major attractions in the greater Miami area.

The rates for this convention will be \$12, 14,



and 16 for a double or twin bedroom, \$10 for a single. A third person, child or adult will be \$3. Those desiring the American Plan, which includes breakfast and complete seven course dinner nightly, will be available at \$3 per person.

Any and all members of the above convention wishing to arrive two days in advance or wishing to remain two days after the official convention has adjourned, can still enjoy the same convention rates if rooms are available.

Other costs in which you may be interested are as follows: Annual Education Conference Registration Fee will be \$5.00. The Banquet with a night of entertainment will be in the area of \$6.00 to \$7.00. Also it is our hope to get a ½ price on children for the Banquet.

### Educational Program

The theme of the 29th Annual Educational Conference of the National Association of Sanitarians is "Planning Together for Community Health." The topics that will be covered during the Educational Conference will be informative, interesting and challenging to Environmental Health Personnel. The program will include talks and discussions on Air Hygiene, Radiological Health, Housing, Urban Renewal, food, milk, hospital, water pollution, small sewage treatment plants, pesticides, and administrative techniques.

The keynote address at the opening general session will be Dr. Robert Anderson, Assistant Surgeon General, United States Public Health. The title of his talk will be "Cooperative Planning for Meeting the Challenges of a New Society." Following Dr. Anderson's talk a reactor panel of top public health people from various parts of the United States will take place.

In that a complete program will be printed in the March-April issue of this journal, we merely attempt to give you a few of the highlights of this program to date.

In the Administrative Association, Professor Gilbert Kelso now with the U.S.P.H.S. is in the process of arranging for a half day session on Administration techniques in Environmental Health. Briefly with an introduction into administration, fees for services, Advisory Committees and then a session on Performance Analysis—A discussion of the use of work load and cost studies in an Environmental Health program. There will be audience participation in the preparation of a performance analysis

study and its application to management decisions for a hypothetical program.

At each conference industry plays a leading role in depicting products, services and equipment and their relation to public health, or to be more specific, their relation to getting the job done in public health. A panel discussion followed by audience participation on the general topic of "Sanitarians Benefit from Close Working Relationship with Industry" is now in the making.

Arthur F. Novah, Professor and Head Department of Food Science and Technology, Louisiana State University will present a lecture on Radiation Preservation of Food.

Clarence Edwards of Quincy, Massachusetts will present a program on the "Use of Photography to Depict an Environmental Health Program."

Orville Defrain of Lincoln, Nebraska will give a talk on "Professional Training for all Food Service Personnel." The program now in effect in Lincoln will eventually be used nation wide.

In the area of Air Pollution, a staff of teaching personnel from the Robert A. Taft Sanitary Engineering Center in Cincinnati and headed by James Sheehy will cover such subject areas as: Air Pollution and its effect on man, effects on property and vegetation, measurement of Air Pollutants and the control of Air Pollution.

Leroy Houser of the P.H.S. Washington office will speak on the subject "Fifth National Shellfish Sanitation Workshop."

A workshop on the Hospital Environment will be chaired by Erwin Krosnoff, University of Michigan Hospital. This should prove very enlightening in that it was at the 24th A.E.C. held in Miami that the N.A.S. held its first workshop on the Hospital Environment.

The most urgent and all encompassing need throughout the country is to motivate and convince Hospital Staff and Personnel of the whys and hows of Environmental Health, beginning with hospital administration and working down. The key to this is to prove the positive relationship between Environmental Sanitation and infections. Many are working on this all over the country, but the complexity of the problem is staggering. In any event, a better understanding of mutual goals and problems can result from the session.

Room does not permit us to continue, but please be assured that the 29th A.E.C. will be the best.

More later!—Nicholas Pohlit, RS MPH, Executive Secretary, National Association of Sanitarians.

## SCIENTIFIC MEETING AND HISTORICAL EXHIBIT AT THE U.S. NAVAL HOSPITAL, ST. ALBANS, NEW YORK

The United States Naval Hospital, St. Albans, N.Y., was host to the scientific sessions of the Association of Clinical Scientists' Spring Meeting on 1 May 1965. The Commanding Officer, CAPT John W. Albright, MC USN, welcomed Association members on board at 9:00 a.m. The Chairman of the Committee for all local arrangements was CDR Jenő E. Szakacs, MC USN, Chief of the Laboratory Service at St. Albans, assisted by the staff medical officers and residents of the laboratory service.

The entire day was devoted to a "Symposium on Recent Advances in Clinical Science." Members and guest speakers were scheduled to deliver twenty-five papers in four sessions. The topic of the first session was centered on Laboratory and Clinical aspects of infection with Atypical Mycobacteria, (unusual forms of tuberculosis), supplemented by instructive exhibits on this important subject. These papers were presented by staff members of the Naval Hospital.

The session after luncheon presented coagulation of blood in blood vessels and in the test tube. "Clotting of Fibrinogen" was discussed by Dr. K. Laki, of Bethesda, Maryland, "Disseminated Intravascular Coagulation in Diseases of Hypersensitivity," by Dr. Donald G. McKay of P. and S., Columbia University, N.Y., Dr. Leon Sussman of New York presented data on "The Partial Thromboplastin Test."

The two other sessions were devoted to a variety of subjects where progress in the last year was particularly rapid; to name only a few papers, "Electron Microscopic Studies of Dedifferentiating Liver Cells," by Drs. Frederick F. Becker and Bernard Lane of New York University, Bellevue Hospital, "Human Chromosome Analysis," by LT Larry G. Dickson, MC USN, and "Gaschromatographic Analysis of the Fatty Liver," by Irene Roeckel of the University of Kentucky, may be considered representative.

Coincident with the meetings, the Historical Committee of the Naval Hospital, headed by CAPT Arthur Errion, MC USN, arranged a unique Exhibit of Laboratory Instruments of the period 1700 to 1900. Microscopes, hematology equipment, glassware from Louis Pasteur, and the armamentarium of the clinical chemist of the nineteenth century were well represented. Of special interest, particularly to New Yorkers, were the original Daguerreotype

plates of Dr. J. W. Draper (1850) of the University of New York, representing the earliest form of photography and an absolute first in photomicrography.

The exhibit is open to the public from 8:00 a.m. to 5:00 p.m. daily through September.—Commanding Officer, U. S. Naval Hospital, St. Albans, N.Y.

## IMPORTANT NEW APPOINTMENT

George H. Reifstein, MD, FACP has been appointed to the newly established position, Technical Director of Clinical Research and Postgraduate Medical Education, in the Navy Medical Department. He will be responsible for evaluating the residency training program with a view to improvement of the teaching conducted in various specialties, and will also try to enhance the effectiveness of clinical research being carried on in the naval hospitals. Dr. Reifstein brings to his high ranking assignment a rich background. He holds a Captain's commission in the Naval Reserve, of the Medical Corps and is President, Association of Hospital Directors of Medical Education. He is certified by the American Boards of Pathology and Internal Medicine, with the subspecialty-Cardiovascular Diseases. Over the years his experience has included clinical practice, teaching, research and laboratory work, and achievements in anatomic pathology. He is also familiar with medicine in its Navy setting through tours of active duty and his background as Consultant at the U.S. Naval Hospital, Oakland, California. His primary task to coordinate and strengthen the clinical research and training programs in naval hospitals is expected to yield important results.

## SECNAV—RETENTION POLICY BOARD

I still consider the retention of high quality officers and enlisted men to be our number one personnel problem. The Secretary is completely mindful of this problem and is applying maximum effort towards its solution. He, as you know, has established a Retention Policy Board with himself as chairman supported by a Task Force headed by RADM John M. Alford to examine in depth the factors bearing on retention and to develop a plan for attacking these problems. SECNAV NOTICE 5420 of 29 January announced the formulation of this effort and I wish all hands to know that it has my complete and enthusiastic support. This is an approach which can have far reaching beneficial effects on the Navy, and I will provide you with progress reports as they become available.

## TENTH ANNIVERSARY OF THE INTRODUCTION OF THE POLIO VACCINE

Dr. Luther L. Terry, Surgeon General of the Public Health Service, issued the following statement on the tenth anniversary of the licensing of the Salk vaccine April 12, 1955:

"The tenth anniversary of the introduction of the polio vaccine by Dr. Jonas Salk finds us within virtual reach of a long-sought goal—the elimination of the disease in the United States.

"Only ten years ago, there were over 28,000 cases of polio reported in the United States. In 1964 there was a total of 121. This represents an historic triumph of preventive medicine—unparalleled in history.

"Dr. Salk's contribution, in terms of the reduction of human suffering, is immeasurable. On this tenth anniversary, I am happy to pay renewed tribute to his great achievement.

"It is fitting that we also as a nation pay tribute to such pioneers as Dr. John Enders, who first developed a way to grow the polio virus in quantity; Dr. Albert Sabin, who developed the oral vaccine, which has been widely used with fine results, and to the hundreds of organizations and thousands of individuals who have contributed their time and funds to a great cause.

"It is also fitting to salute the tremendous contribution of the National Foundation and its President, Mr. Basil O'Connor. The Foundation not only financed the work of both Dr. Salk and Dr. Sabin but has worked with patience, ingenuity, and great effectiveness over the long years toward the conquest of polio."—USDHEW, Public Health Service.

## ACKNOWLEDGMENT

CAPT John H. Cheffey MC USN desires that LCDR Guy Townsend MC USN also be included and credited for his splendid contribution to the article "Humeral Torsion" Vol. 45, No. 6. Dr. Townsend is presently on duty at the U. S. Naval Hospital, Camp Pendleton California.

## ANNUAL MEETINGS

The American Heart Association's 38th Scientific Sessions will meet October 15-17, 1965 and the Annual Meeting will convene October 17-19, 1965 at the Americana Hotel, Bal Harbour, Miami Beach, Florida.

The Council on Arteriosclerosis American Society for the Study of Arteriosclerosis 19th Annual Meeting will convene October 13-14, 1965 at the Deauville Hotel, Miami Beach, Florida.

## ARMED FORCES DAY

On this Armed Forces Day, 15 May 1965, we of the United States Navy are proud of our continuing service to our country. We pledge ourselves anew to value the best of what is old, find the best of what is new, and meet with determination all challenges which our part in the protection of our nation and of the American people bring to us.—ADM David L. McDonald, Chief of Naval Operations.

## CLINICAL RECORD, OPHTHALMOLOGIC CONSULTATION

"DD Form 741 (10 63; Clinical Record, Ophthalmologic Consultation, has never been adopted for general Navy use. This form does not appear in the Manual of the Medical Department nor is it available for issue thru the Forms and Publications Segment of the Navy Supply System. Clinical Record, Consultation Sheet (SF 513) is used for all consultations including Ophthalmological. Since this too is a clinical form, results are transcribed on Chronological Record of Medical Care (SF 600) in the individual's Health Record. Accordingly, the use of DD Form 741 should be discontinued and local stock destroyed and the above mentioned Standard Forms should be used in lieu of the DD Form 741."

—Professional Div., BUMED

## NAVAL AVIATION MEDICINE'S STAINED GLASS WINDOW DEDICATED

On Sunday, 14 March 1965, a Dedication Service was held at the Naval Aviation Memorial Chapel, Naval Air Station, Pensacola, Florida, commemorating the installation of the Chapel's first stained glass window, Naval Aviation Medicine's "Christ, The Healer." Contributions in the amount of \$3,500 were received from active and retired medical department personnel from all over the Navy, the majority of which were connected with aviation medicine.

The theme of healing is centrally portrayed in the window by the miracle at the pool of Bethesda when Jesus by His Divine power and simply speaking the words, "Take up thy pallet and walk," cured the man of his long infirmity. Standing in the background is the scribe who sought to persecute Jesus for performing the healing on the Sabbath.



In the lower left Jesus is shown with the blind man whom He healed with the touch of His hand and dismissed with the words, "Thy faith hath made thee whole."

At the lower right is depicted the dramatic story of the man with palsy, whose four friends, unable to reach Jesus because of the crowd, climbed to the housetop, removed some tile, and lowered their friend through the opening, bed and all, to the feet of Jesus. When Jesus saw their faith, He said to the sick man, "Thy sins are forgiven thee."

RADM J. Floyd Dreith, CHC USN, Chief of Chaplains, was the guest speaker at the 0930 Ceremony. Adding to the beauty of the occasion was the Naval Air Training Command Choir, who led the large group in singing hymns, concluding with their famous "Almighty Father."

"Christ, The Healer," is a beautiful window, and a fitting tribute to our medical people.—Commanding Officer, U. S. Naval Aviation Medical Center, Pensacola, Florida.

## DENTAL SECTION

### EFFECT OF PARTIAL DEFLUORIDATION OF A WATER SUPPLY ON DENTAL FLUOROSIS —RESULTS AFTER 11 YEARS

*H. S. Horowitz, F. J. Maier, and M. B. Thompson,  
Jour Pub Hlth 54 (11): 1895-1903, 1964.*

For the past 11 years, excessive fluorides in the community water in Bartlett, Texas, have been chemically removed using activated alumina as the medium. During this period, the average level of fluoride delivered to water consumers has been 1.17 parts per million.

A base-line survey was conducted in 1954 using Dean's Classification to determine the extent of dental fluorosis among the continuous resident children. A follow-up examination was made in the fall of 1963 after 11½ years of partial defluoridation of the water supply.

Children ten years of age or younger in 1963 had a mean fluorosis score of 0.43, compared to the base-line figure of 2.36 for this age group. Children 11 years old and over, whose period of tooth calcification overlapped the change in fluoride content of the water supply, had a smaller reduction in average scores, which were 2.71 and 2.20 in 1954 and 1963, respectively.

While 94 percent of children aged ten or under examined in 1954 had positive signs of fluorosis, by 1963 only 21 percent exhibited mottling, and nearly all of these were the milder categories. No child ten or under was seen in 1963 with severely

mottled teeth and only two exhibited moderate fluorosis. Dental fluorosis is still a serious public health problem in many areas of the United States. Persons living in nearly 400 communities consume water from public supplies containing more than twice the fluoride level considered as optimal. These communities, therefore, fail to meet the minimum requirements for public water supplies as established by the U. S. Public Health Service. Leaders in these cities and towns should take steps to adopt partial defluoridation in order to meet these standards and thus promote the well-being of their future populations.

### FACIAL PAIN

*A. P. Friedman, Oral Surg, Oral Med,  
and Oral Path 18(6): 730-736, 1964.*

The underlying disorder causing facial pain may be anatomic, physiologic or psychologic. Three main categories may be used to classify the pain: (1) typical neuralgias, primarily neurogenic, (2) atypical neuralgias, primarily vascular and psychogenic, and (3) facial pain secondary to other extracranial and intracranial causes. This discussion mainly covers atypical neuralgias and their subdivisions.

*Atypical Neuralgias—Symptoms.* The pain may be paroxysmal, of several hours duration, or constant; it does not follow the anatomic course of the cranial nerves; it is not precipitated by stimulation of a trigger area; it is usually described as a pressure or as a pulling, stabbing or drawing sensation. It is associated with autonomic nervous system signs,

such as lacrimation, nasal congestion, or increased skin temperature. The pain is not relieved by surgical section of sensory nerve fibers, but is frequently relieved by vasoconstrictors. Commonly the condition is associated with a personality problem.

The pathogenesis of these neuralgias is still uncertain. However, there is fairly wide agreement that in some cases periodic attacks of local dilatation of extracranial vessels occur in areas mainly supplied by the branches of the external carotid arteries. This hypothesis seems to be supported, in some cases, by the presence of a distended temporal artery, injection of the eye, congestion of the nose, local increase in skin temperature, occasional relief upon compression of the temporal or carotid artery, and the usual good response to vasoconstrictive agents.

Psychological aspects can play an important part in the various types of facial pain. Each individual will vary in his reaction to pain and a person's reaction to pain may be distinct from the sensation he is experiencing. Many of the patients do not recognize that they were under greater stress, or were emotionally upset or fatigued prior to an attack. The personality pattern most commonly observed was an adult who was ambitious, perfectionistic, over-conscientious and efficient. However, facial pain may be a symptom of an anxiety state or depression.

*Facial Pain Secondary to Other Extracranial and Intracranial Causes.* Some of these causes may include pain of dental origin, tumors of the mandible and disorders of the temporomandibular joint, disorders of the nasal and paranasal structures (sinusitis), tumors of the nasopharynx, temporal arteritis, postherpetic neuralgia, referred pain from cervical disc and coronary thrombosis, tumors of the cranial nerves (mainly five and eight), intracranial tumors with secondary nerve compression, aneurysms and anomalies of blood vessels.

The author has three tables included in his article which give some good comparisons or criteria in the various types of pain.

(Submitted by: CAPT C. R. Parks DC USN, U.S. Naval Dental School, NNMC, Bethesda, Md.)

#### SIMPLIFIED ENDODONTIC FILE AND REAMER CLEANING

*H. G. Greene, JADA 70(1): 79-82, 1965.*

In this report an endodontist has devised a new method of cleaning endodontia files and reamers. With his technic, the operator is able to clean files and reamers and keep them free of dentinal debris,

using only one hand and shortening his work time. The importance of not allowing a debris laden instrument to enter the canal during the biochemomechanical phase of endodontic therapy is highly emphasized and reasons for same are given. It is noted that other methods of instrument cleaning, i. e. wiping with cotton roll, sterile towel, gauze or rubber dam, requires both of the operator's hands.

The technic suggested consists of snapping off heavy walled culture tubes the length of a #2 cotton roll (1.5" or 37 mm) and inserting cotton roll into same. An inlay ring or the like is filled with stone or plaster, into which a lubricated culture tube is inserted. Just before the stone or plaster begins to set the tube is withdrawn. This provides a base holder for several of the sterilized cut culture tubes and inserted cotton rolls. A file or reamer can then be inserted into the canal, turned  $\frac{1}{4}$  or  $\frac{1}{2}$  turn, removed and inserted into cotton roll and given a slight counterclockwise twist. This removes debris from between the flutes. The instrument is then sterilized, reinserted into the canal and the cycle is repeat. If at any time a new cleaner is desired, the old one can be instantly discarded and a new one is available.

(Submitted by: LCDR Homer Clarke DC USN, NAS Norfolk, Va.)

#### SNUFF DIPPERS' INTRAORAL CANCER: CLINICAL CHARACTERISTICS AND RESPONSE TO THERAPY

*R. L. Brown, J. M. Suh, J. E. Scarborough, S. A. Wilkins, and R. R. Smith, Cancer 18(1): 2-13, 1965.*

The incidence of cancer of specific organ sites varies strikingly in different geographic regions of the world and even in specific areas of a country. Oral and pharyngeal cancer is by far the most common neoplasm in India and the Philippine Islands. The cancer institute of Madras reported 48% of all neoplasms were oral or pharyngeal in origin. More specifically 71% of oral cancers and 26% of all malignant tumors arose from the buccal mucosa. By contrast, in the United States buccal cavity cancers accounted for only 4.6% of all newly diagnosed cancers in males and 1.7% in female patients.

Cancer morbidity studies suggest that oral cancers occur more frequently in low income than in high income groups. In India and the Philippines where the incidence of intraoral cancer is high and the economic status low, the use of tobacco with slaked lime and betel nut is associated with these cancers.

In the southeastern United States dipping snuff is a fairly common habit, especially among women of low income groups. It is suspected that this habit is associated with an increased incidence of intraoral cancer.

This study was undertaken to: 1. Determine the association between the use of snuff and intraoral cancer. 2. To compare the biologic behavior and response to therapy of these cancers, to those seen in non-snuff users.

A group of 394 intraoral cancer patients were studied with regard to exposure to snuff, tumor characteristics, type of therapy and survival.

**Results.** In this study, patients with oral cancer were found to use snuff frequently, especially those with malignant lesions in the gingivo-buccal areas. The snuff dippers' cancer had the following characteristics: it occurred predominantly in women; it was associated more frequently with histologically low-

grade tumors; it was also associated with an increased incidence of leukoplakia, new primary intraoral cancers, increased regional metastases and increased 5 year survival rates.

Those patients treated by surgery appeared to have a higher survival rate than did those treated by radiation.

The 5 year survival rate for all intraoral cancer patients increased from 44% for the earlier portion of the study to 54% for those in the last part of the study. The 10 year survival rate was 27.5%.

In the group of patients followed for 10 years most of the deaths during the last half of this period were due to disease other than the cancer responsible for the patient's first admission.

(Submitted by: CAPT Seymour Hoffman DC USN, U. S. Naval Training Center, Great Lakes, Illinois.)

## PERSONNEL AND PROFESSIONAL NOTES

**Dietary Fluoride Supplements.** Relative to BUMEDINST 11330.1A, stations of the Navy and Marine Corps, where children aged 16 years or less regularly receive the major portion of their potable water requirements from the station's water supply system, should take action toward fluoridating the station water. The cognizant dental officer shares responsibility for support of this program (*U. S. Navy Medical News Letter* 43(10): 24, 1964). At some naval activities, unique situations have led to the question of whether dietary fluoride supplements (fluoride tablets, etc.) might not logically be substituted for base water fluoridation. A report on this subject, including a thorough literature search by CDR R. E. Austin DC USN, Consultant for Preventive Dentistry to CINCLANTFLT Dental Officer, shows that dietary fluoride supplements have shortcomings as a substitute for water fluoridation. Two principal facts justify this position. First, a daily dose will cause a peak in the blood fluoride level followed by rapid elimination; and the amount of fluoride in the blood stream during most of the 24-hour day will be insufficient to cause an optimum deposition of fluoride in the enamel of developing teeth. Second, clinical tests have shown that average parents, after a short period of enthusiasm, will forget or neglect to ensure each child's daily taking of fluoride supplement. For these reasons, the cognizant dental officer should take the position that substitution of

dietary fluoride supplements for fluoridation of base water is justified only when some engineering feature precludes fluoridation of the base water supply.

**Commendation for Service to the Fleet.** In a letter dated 8 January 1965, the Commanding Officer, USS AMERICA (CVA-66) expressed his appreciation to the Commanding Officer, U. S. Naval Dental Clinic, Norfolk, Virginia, for the very great service rendered to the pre-commissioning detail of AMERICA (CVA-66). The magnitude of this service was demonstrated by the fact that the Naval Dental Clinic, Norfolk, devoted over 12,000 appointments for dental treatment of all types to the crew during November and December 1964. The Commanding Officer appreciated receipt of this treatment prior to the period of great need for shipboard training. He also stated that Naval Dental Clinic Norfolk's outstanding treatment had made a considerable contribution to the morale of his crew. To the commendatory forwarding endorsements by Commander in Chief, U. S. Atlantic Fleet, Commander Naval Air, U. S. Atlantic Fleet and Commandant, FIFTH Naval District, the Surgeon General was pleased to add his "well done."

**Sixteenth National Children's Dental Health Week** February 2-8 1965. Typical of the Navy Dental Corps participation in the annual National Children's Dental Health Week, the following staff and student



dental officers of the U.S. Naval Dental School, National Naval Medical Center, Bethesda, Maryland presented lectures to nearly 2,000 students of eight area schools:

CAPT G. H. Rovelstad DC USN  
CDR C. J. Swanson DC USN  
LCDR M. S. Davis DC USN  
LCDR C. J. McLeod DC USN  
LCDR H. O. Scharpf DC USN  
LCDR A. G. Iandolo DC USN  
LCDR B. E. Pines DC USN  
LCDR H. S. Tugwell DC USN

*Dental Officer Presentations.* The Veterans Administration Hospital, Brockton, Massachusetts, with the joint sponsorship of the South Shore Dental Society held its 10th annual Dental Day, 17 February 1965. The program included a panel, "Meet the Deans", featuring RADM Clemens V. Rault DC USN (Ret.), former Chief of the Dental Division, and presently Dean, Georgetown University School of Dentistry.

Also appearing on the program, CAPT Julian R. Conant DC USN, US Naval Station, Newport, Rhode Island, presented a lecture entitled, "Local Environment Factors in the Etiology of Periodontal Disease-The Effect and Methods for Their Correction." CAPT Conant is a Diplomate of the American Board of Periodontology.

CAPT William R. Stanmeyer DC USN, Dental Officer, U. S. Naval Academy, Annapolis, Maryland, hosted a meeting of the Western Shore Dental Society on 25 February 1965. In addition to those table clinics presented by the civilian members of the Society, the following table clinics were presented by dental officers of the Naval Academy: CDR "B" Frank Taylor DC USN, "Use of the Panorex in Diagnosis," LCDR Joseph A. Bodner DC USN, "Parallel Pins in Crown and Bridge," LCDR William J. Watson DC USN, "Establishing the Bite in Crown and Bridge," and LT Thomas J. Cronin DC USNR, "Orthodontics in Preventive Periodontics."

LT Joseph W. Lenihan DC USNR, Third Dental Company, Third Marine Division, presented a lecture entitled, "Emergency Care for the General Practitioner," in the Dental Office before the Okinawa Armed Forces Dental Society on 25 February 1965 at Fort Buckner, Okinawa.

CDR Albert R. Smith DC USN, 4th Dental Company Force Troops FMFLANT, presented a lecture entitled, "Preventive Periodontia," before the February meeting of the Camp Lejeune Dental Society.

The Great Lakes Gold Foil Seminar was recently

reorganized under the direction of CAPT Myron G. Turner DC USN, Dental Officer, U. S. Naval Training Center, Great Lakes, Illinois. Officers of the study group are: LT G. T. Ballard DC USN, President; LT R. G. Schonbrun DC USNR, Vice President; LCDR T. J. Lommel DC USN, Secretary-Treasurer. Dr. Clifford Miller, Associate Professor of Operative Dentistry, Northwestern University, is the Seminar Director.

The group recently featured a lecture and clinical demonstration by Dr. H. William Gilmore, Associate Professor and Chairman, Department of Operative Dentistry, Indiana University.

CDR A. D. Echols DC USN, U. S. Naval Dental Clinic, Norfolk, Virginia, presented a lecture and conducted a discussion about "Removable Partial Dentures-Survey and Design," before the Delta Sigma Delta Study Club on 16 March 1965 in Norfolk, Virginia.

#### 4th DENTAL COMPANY FORCE TROOPS FETED ON 14th ANNIVERSARY

The following article appeared in a special supplement to the station newspaper, Camp Lejeune Globe, 1 April 1965:

The only all-Navy command within Force Troops, the 4th Dental Company, is composed entirely of dental officers and technicians in sufficient strength to support a Marine Division, Marine Aircraft Wing or Force Troops.

It is not intended that the company participate in the early phases of combat operation, but, upon establishment of a stabilized area, dental services will be concentrated where most effective.

The 4th Dental Company, commanded by CAPT C. G. Veno DC USN, may mount out as a whole or it may be subdivided to support smaller units. It has the equipment to set up a clinic for one dental officer or as many as 25 dental officers.

For a small unit in need of dental care, one dental officer and technician can be deployed with a trailer equipped with the necessities for a complete dental set-up.

For larger operations CP and GP tents can be utilized to provide the space needed for all phases of dental care. In this way the company can take dental treatment to the unit rather than having its personnel travel to a central clinic.

Dental personnel from the company participated in Operation "Steel Pike I" in October and November of last year. Detachments of dental officers and technicians were dispatched to render underway

treatment to personnel aboard several ships of the Task Force, while the main body of the company embarked for passage to Spain.

As the war games progressed, the 4th Dental Company joined the assault forces on the beaches

of Spain and immediately became operative for dental emergency treatment. Within a matter of hours the company had reached its assigned campsite, erected dental clinic facilities, and was rendering routine dental treatment.

## OCCUPATIONAL MEDICINE

### ORTHOPEDIC EVALUATION OF EMPLOYEE FOR CONSIDERATION OF EMPLOYMENT IN HEAVY INDUSTRY

*John E. Burch, M.D., Miami, Fla., Industrial Medicine and Surgery  
34(2): 127-129, February 1965*

This paper represents the experience of the past seven years in formulating orthopedic examinations of prospective employees in heavy labor. While primarily our attention is devoted to disorders of the spine, we take into consideration the weight-bearing joints of the lower extremity, the hip, knee and ankle and also the important levers of the upper extremity representing the shoulder, elbow and the hand.

I dislike the term Manual Labor, since all workers use their hands, but it is the association of the secondary levers of the shoulders, spine and hips that makes a worker useful. The prospective employee is usually an adult male between eighteen and forty years of age, and presumably in good health and physical condition; but he may fool you.

So you must be on your guard and look for hidden disabilities that might render the candidate a liability rather than an asset. A careful evaluation is made of function and range of motion of the spine and extremities on a fair objective basis associated with good technical x-rays of the lumbar or dorsal spine.

Those candidates who have potential disabilities or deformities are rejected. The question of a fair risk for work is considered, but most recently all employers usually want applicants passed or not passed, no inbetween. However, it is sometimes desirable and necessary to accept for employment certain individuals who because of seniority have established themselves by prior employment in the plant or factory. As time goes on, however, it is the policy of management to adopt more rigid standards for employment.

While this method of examination will not eliminate back injuries, it will tend to eliminate compensation claims that are based on congenital and structural defects of the spine that pre-existed. In addition, there will be a permanent record for management which will show a pre-existing defect and will be useful when, in future injuries, it is alleged that the defects were caused by the said injury.

It must be realized that the employer is legally permitted to protect himself from liability due to a pre-existing spinal weakness or deformity in a prospective employee by requiring a pre-employment physical examination.

The employer should also realize that the medical examiner, with his most modern diagnostic equipment, cannot foresee the future, the accident rate in any worker, or the onset of a pathological disease process.

I use the following criteria:

1. *A Good Risk.* Having no major defect of the spine or extremities, can be employed at any job requiring repeated strain or effort.

2. *A Fair Risk.* Is sometimes not acceptable by certain areas of management. However, if this worker by reason of previous employment desires promotion, and these defects are found which represent a fair risk, it is usually a process of bargaining between labor and management to accept this employee for advancement. In this category, there are certain defects of the spine and extremities present but are of such a nature as to permit employment, but not continued back labor.

3. *A Poor Risk.* Is a rejectable applicant. This man has defects present of such a degree as to disqualify him for heavy lifting or other forms of heavy labor. It goes without saying that the examiner must be completely aware and have intimate knowledge of the requirements of the job for which the candidate is applying. These categories in the electrical industry are usually spelled out in writing for the examiner so that he may decide whether this applicant could fit the type of job capacity.

Three parts of the examination of the candidate:

1. A medical history inquiring into previous disabilities of the spine and extremities, especially important where there is a history of sport injuries in high school or college and in which no medical records are available.

2. An adequate orthopedic examination of the spine and extremities.

3. Careful exacting diagnostic x-rays are made. We make anterior, posterior, and lateral x-rays of the lumbar spine, and a spot lateral of the lumbosacral joint, right and left thirty- to forty- degree obliques of the lumbar spine to show the facettes and pars interarticularis portions of the spine. The oblique views are absolutely essential to rule out one of the most frequent congenital anomalies, bi-lateral or unilateral spondylolysis, which occurs at L-5, and sometimes L-4. Where there is previous history of fracture or dislocation of the upper or lower extremity, an x-ray is also made of this area, if in the opinion of the examiner it is needed.

#### *Orthopedic Examination*

All examinations are conducted without clothes, shoes or socks, so that the spine may be examined and inspected from the base of the neck to the tip of the coccyx. It is very important to have back lighting, so that there are no shadows projected by the spine or extremities.

*Position I:* Candidate stands barefoot, spine facing you, heels and knees together, knees extended, hands at his side. It is most important to use your eyes for inspection and observation. Look for pelvic obliquity, lumbar lists, right or left scoliosis, fixed or mobile, flatness of the lumbar spine with loss of the lumbar lordosis, excessive lumbar lordosis with increased lumbosacral angle. Very often a drop-off at L-5 spinous process will indicate a spondylolisthesis. The dynamics of the spine are then examined by means of active flexion, extension, right and left bending, right and left rotation. During this examination, you must look for surgical scars such as a laminectomy, or areas that might have been

fused, or other surgical procedures on the spine. Neck motion in flexion, extension, rotation and deviation are also observed. You should also examine the candidate in this position: Arms abducted to determine the scapulo-humeral rhythm, and the presence or absence of atrophy of the shoulder girdle muscles.

*Position II:* With the patient facing you, examine the upper extremities, putting the candidate through the procedures of abduction, adduction, rotation and elevation of the shoulders, flexion, extension of the elbows, wrists, and fingers; careful inspection of the hands and fingers for opposition of the thumb to the opposing fingers, the presence of missing fingers, ankylosed joints, incomplete extension and residuals of peripheral nerve injuries.

*Position III:* With the patient prone on examining table, examine the spinal musculature with light pressure of fingers. If there is muscle spasm it will be felt as hardness of the muscle underneath the examiner's fingers and frequently associated with muscle tenderness. Ely's sign, flexion of the knee on the thigh, produces pain in lumbosacral disease and also sacroiliac disease. This position also is adaptable for checking the Achilles reflex.

*Position IV:* With the patient supine on examining table, check for active and passive straight leg raising. Active straight leg raising in a young individual who is not obese is ninety degrees above horizontal, however, this will vary with physical habitus. Brittain sign, the so-called Soto Hall sign with the patient sitting at lumbar angle of ninety degrees with the knees fully extended and the hips flexed ninety degrees. In discogenic disease and chronic sprains of the lumbar spine, individuals cannot do this without some low back discomfort, noticeable to the examiner. The Patrick test is done for sacroiliac pathology, and also Gaenslen's sign, facette rotation test with arms folded, grasping the elbows, the pelvis is rotated to right and left. In a candidate who you suspect has pre-existing low back disorders, dynamic test of the back using head-to-knee test and the so-called Williams sit-up exercise.

The knee joint is then examined separately. You look especially for evidence of internal derangement of the knee, relaxation or laxity of the cruciate or collateral ligaments, presence or absence of increase joint fluid, the presence or absence of atrophy of the quadriceps mechanism. The range of motion in flexion and extension is determined and compared with the opposite knee. The ankle joint is examined, carried through its normal ranges of motion. Widening of the ankle mortise is noted. Valgus position



of the foot in standing might indicate an old rupture of the tibio-fibular ligament or the presence of an old healed Pott's fracture.

Patient is asked to do a deep knee squat to determine the flexibility of the hips, knees and ankles, and also to do the duck or monkey walk, which also indicates his ability to walk forward and backward in this position, and indicates the state of balance. Candidate is then asked to walk forward and backward on his toes, heels elevated and backward, and then forward and backward on his heels with toes elevated. This is a balance test and also a functional dynamic test of the strength and integrity of the arches and structures of the foot and ankle. After these maneuvers are performed, then it is time to look at the x-rays.

#### *Summary*

1. A pre-employment examination of the prospective employee in heavy industry requires a careful orthopedic examination, correlated with proper x-ray studies of the spine.

2. In order to be fair and impartial, the examination must be conducted on a strictly objective basis.

3. All candidates who by x-ray examination show evidence of multiple congenital defects which are considered disqualifying, associated with careful orthopedic examination of the spine are disqualified for heavy labor.

These categories for selection of heavy labor are divided into:

##### *A. Good Risk*

1. Four or six lumbar vertebrae.
2. Un-united epiphysis of pars interarticularis.
3. Mild asymmetrical changes of the posterior apophyseal joints.
4. Spina bifida occulta of one segment.
5. Schmorl's nodes.
6. Transitional lumbar vertebra with solid fusion of one or both transverse processes to the ala of the sacrum.
7. Increased lumbar lordosis.
8. Un-united epiphysis transverse process.
9. Normal anatomy of the lumbar spine.

##### *B. Fair Risk*

1. Spina bifida occulta of more than one segment.
2. Schmorl's nodes at L-4, L-5 segments.
3. Degenerative arthritic changes in the upper lumbar spine.
4. Marked asymmetry of the facettes of the lumbosacral articulation with sclerosis.

##### *C. Poor Risk*

1. Spondylolisthesis of any degree.

2. Bilateral spondylolysis.
3. Transitional lumbosacral vertebra, lumbarized first sacral with articulation with the ala of the sacrum and pseudarthrosis formation.
4. Degenerative disk disease L-4, L-5, S-1.
5. Wedged vertebrae, two or more, residuals of juvenile epiphysitis.
6. Hemangioma or any other tumor of vertebra.
7. Osteoarthritis of generalized type of any degree.
8. Clasp-knife deformity.
9. Previous lumbar disk surgery, Marie-Strumpel arthritis, osteoporosis, hemivertebra.

#### *Conclusion*

Careful examination of the spine and extremities with x-ray correlation will tend to eliminate candidates with definite or potential disabilities of the spine and extremities.

Our rejection rate is about 9.6% of the applicants.

The recurrent low back sprain or strain is still our number one problem in industry, causing many lost hours of work.

The two areas of the spine that are most affected in lifting strains are the lumbosacral joint and the dorso-lumbar segment of the spine. The sprain of the lumbo-sacral junction is usually a flexion lifting sprain, or a fall in a flexed position. The dorsolumbar sprain is usually a rotary, twisting type of sprain.

Injuries of the knee joint associated with internal derangement, damage to the meniscus, and associated injuries of the cruciate and collateral ligaments are the next most frequent injuries in our experience.

Two of the most troublesome problems that the medical examiner encounters is that of the aging worker who has repeated back strains and back injuries and other associated joint injuries, and the obese worker under forty who becomes more or less a hazard to other workers, especially if his work entails climbing of electrical poles and steel ladders, utilizing climbing hooks. I think the incidence of disk injury and disk degeneration in adult males seems to be increasing.

I do not agree with the majority of authors that this is related to our evolutionary experience in changing from a quadruped type of gait to an orthograde posture. Rather I feel it is related to a soft way of life, too much food, not enough exercise, improper conditioning of back, leg and shoulder muscles, fat bellies and soft backs.

The answer to this latter problem might be the

development of physical conditioning, exercises during coffee breaks, and other periods while at work, to encourage the worker to remain physically

fit. Also, in association with this a safety school to teach the worker how to avoid stress injuries to the spine and extremities.

## A REPORT ON PROTECTION OF LONGSHOREMEN FROM CHEMICAL SPILLS

*Safety Standards 14(1), January-February 1965\**

What his nose knows about carbon monoxide doesn't help a longshoreman much. It's an odorless gas and can be lethal. But like the rest of us, he's likely to become wary in the presence of a strong, unfamiliar odor, and hesitant to slop around in a liquid which burns on contact. Also like all of us, he's apt to be guided by his senses—put up with an odor if it's not too unpleasant, wipe up something by hand if it doesn't hurt his skin immediately, and not worry too much about breathing and swallowing a little dust if it doesn't taste bad or choke him. Unfortunately, the longshoreman's senses do not give him timely warning of many chemicals. And if the bag or drum which contains the chemical being transported is ruptured, he can be in trouble before he finds out that the substance is harmful.

Even though all chemical products manufactured and used in industry—many of them toxic, corrosive, or flammable—are transported by land, sea, and air, workers should encounter no chemical hazards. Normally longshoremen and other transportation workers are not exposed to these hazards because the chemicals are packaged to contain the product. These workers handle the sack, drum, box, or other package—not the product itself. Thus, exposure to chemicals in longshoring aboard ship, or in any other form of transportation, is in itself an accident.

Except for dusty cargoes in bulk or in loose mesh sacks, exposure usually occurs when the container leaks or is ruptured. Although accidents of this type are common, fortunately most exposures have been harmless or have had minor effects. Despite the large variety and tonnage of chemical products handled each year, the injury record is reasonably good. For example, last year, a total of 22,500 injuries were reported to the Bureau of Employees' Compensation. Of these, 375, or 1.7 percent, involved exposure to fires and hazardous chemical cargoes.

### *Accident Potential Always Present*

Nevertheless, if adequate safeguards are not taken, the potential for a serious accident is always present. In the past two decades there were several disastrous cargo fires in this country which took the lives of men aboard ship. In one case, two men were killed by carbon dioxide used as a refrigerant. In two cases, one on the ship and one on the dock, large chlorine cylinders developed massive leaks and many longshoremen suffered varying degrees of exposure. In several cases, men were exposed to fumigated grain or baled cargo which had not been properly aerated before being loaded aboard the vessel. Among any group, a few are allergic to a specific product—castor beans, for example. Several years ago, there were cases where entire gangs developed allergic and toxic symptoms from a castor bean product.

In 1958 the passage of Public Law 85-742 empowered the Secretary of Labor to promulgate and enforce safety regulations and to promote safety in employment under the Longshoremen's and Harbor Workers' Compensation Act. Mainly the Department's concern involves longshoring and ship repairing aboard ships and in some cases shipbuilding and shipbreaking on vessels afloat. Other Federal agencies are also involved. The Coast Guard and the Interstate Commerce Commission, through their control of packaging and stowage, as well as the Department of Labor through its safety regulations are all working to reduce the hazards involved in transporting chemicals.

The Coast Guard has placed stringent regulations on the handling of ammonium nitrate to prevent a repetition of the 1947 Texas City ship explosion that took 550 lives. The hazard of CO<sub>2</sub> from dry ice has been eliminated by prohibiting its stowage below deck. The Department of Labor now requires the stevedore to make certain (rather than to assume) that fumigated cargo has been properly aerated. It has also joined forces with the Coast Guard, the International Longshoremen's Association, and im-

\* Adopted from a paper presented by Ralph W. Netterstrom, Chief, Division of Maritime Safety, Bureau of Labor Standards, U.S. Department of Labor, before 52nd National Safety Congress, October 1964.

porters to ban shipment of untreated castor pomace and to improve packaging to further reduce the exposure to dust or castor beans.

### *Handling Chlorine Leaks*

In the case of the chlorine leak aboard ship, Department experts found widespread ignorance of the necessary precautions to take when a leaking cylinder is discovered in the hold of a vessel. The problem was studied and in cooperation with the Chlorine Institute a pamphlet was prepared and distributed to the industry. Application of the information can prevent a repetition of massive leaks and the consequent dangerous exposures of large numbers of men. The pamphlet stresses the need for extreme care in handling cylinders to avoid fracturing them by dropping.

Those who work in plants that use chlorine daily and who are familiar with its properties, hazards, and means of preventing leaks and protecting against exposures may raise the question: Why doesn't the stevedore know about it? There are two reasons: One is that he may never handle this product. The other, he may have handled cylinders from time to time and possibly never smelled the chlorine because the containers performed their function and allowed none to escape. Chlorine handling is typical of the situation many employers face in handling a wide variety of chemicals. A stevedore may never handle some of these; others he may handle in relatively small quantities in a given lot, and longshoremen rarely are exposed to the toxic products they work with. Nevertheless, accidental exposure is always possible and the question remains: What to do when the bag breaks?

Practically, the solution lies in supplying necessary information and warnings before the emergency arises so that workers will not have to rely on their senses to avoid exposure.

### *Uniform Labeling Aids Safety*

Labeling of packages is one solution. The Manufacturing Chemists' Association has developed a set of recommended labels for use on many specific products and a number of manufacturers use them. The familiar red, yellow, green, and white labels required by the Coast Guard and the ICC on many hazardous cargoes are of great value but they cover broad categories of products and cannot give all of the information required. Language differences in international trade are a problem the International Labor Organization has been attempting to overcome

through adoption of a uniform set of pictographs to indicate flammables, corrosives, toxics, etc. While valuable, they, too, are limited in the amount of information they can convey.

It is not practical to require the stevedore to obtain information on his own because of the present difficulty of obtaining the necessary information in all cases. The Coast Guard regulations ("Explosive or Other Dangerous Articles and Substances and Combustible Liquids on Board Vessels") cover more than 1,800 specific items, and specify packaging and stowage requirements aboard various types of vessels. Some products must be on deck where they can be watched and, if necessary, washed over the side; others must be kept away from heat (as from boiler spaces); others cannot be stowed with products with which they would react if mixed. The regulations indicate which cargoes must be labeled.

The Coast Guard's regulations also contain information on the hazardous properties of substances and general precautions to be taken. They do not necessarily require that the chemical name of all products be placed on the package but that it be listed on the manifest with identifying marks on the cargo so that the ship operator and stevedore will know what the product is. Manifest requirements apply to imports as well as to exports.

The Department of Labor is now preparing a pamphlet which will indicate, for each of the commodities listed, hazardous products and precautions, including emergency equipment, necessary for handling leaking or ruptured containers. This publication will indicate those commodities which could develop flammable atmospheres and whether the gas or vapors would tend to diffuse through the open hatch or tend to accumulate in the bottom of the hold; which incipient fires can be extinguished by water and those that would spread with use of water; which commodities will do little harm in brief and infrequent skin contacts and those to be avoided entirely; which specific type of respiratory protective equipment should be worn as well as conditions under which it is unlikely to be needed. Information on symptoms of over-exposure and first-aid treatment, with particular reference to those cases which should receive medical attention, will also be included.

### *Correct Identification Important*

By checking the dangerous cargo manifest for commodities he may have to handle and the marks on the cargo by which he can identify them, and



then by referring to the pamphlet, the employer will have the information he needs. He will then be able to pass on to supervisors and, when necessary, employees information on what to do in any situation which may arise in terms of protective clothing, respirators, gas masks, or other respiratory protective equipment, and precautions to be taken in cleaning up and disposing of spilled material.

Although it will take some time to complete this project, the Department expects that it will serve as an aid to employers in minimizing worker injuries from toxic and flammable cargoes. In addition to longshoring, the information will be useful in other forms of transportation as well. Manufacturers will be encouraged to make similar information available to their customers.

Recent developments are encouraging. The Department observes that more and more stevedores and longshoremen are recognizing the potential hazards of spills. The workers tend to be more wary and stevedores are beginning to call in chemists to advise on the degree of hazards and means of overcoming it.

The Coast Guard has recently contracted with the National Academy of Sciences for research assistance in dealing with hazardous cargoes, especially the increasing number of bulk shipments. Two Academy committees—Hazardous Materials and the Advisory Center on Toxicology—are working on the project. The results will yield technical data needed by the Coast Guard to develop regulations to protect vessel operating personnel, men who handle loading and unloading, and the general public from exposure to chemical hazards.

Thus, the regulatory agencies involved, as well as employers and unions, are continuing the search for information and methods to further safeguard workers and the public from hazards involved in transporting chemicals. The fact that products being shipped are increasing in variety and tonnage not only permits no letup, but calls for intensified safety effort.

#### HAZARDS OF ALLOYS AND SEMIMETALLICS OF THE FERROALLOY INDUSTRY

*Industrial Hygiene New Report 8(2), February 1965.*

In the ferroalloy industry, there is considerable production of nonferrous and special alloys and semi-metallics in which combustion and toxicity hazards of varying degrees are produced. A run-down

of the actual and potential hazards of more than 60 specific compounds is detailed in a report appearing in two parts in the January and February, 1965, issues of the *Journal of Occupational Medicine*. The report, by Warren C. Roberts, MD, Chief of Medical Services, Western Electric Company, Buffalo, N. Y., is based on the author's 15 years' experience, rather than on critical investigative work. Some of his information in summary is given here:

Generally the lump-size alloys are harmless to the health and the chance of combustion of lump-size alloys is remote unless they are mixed with fumes or a gas-forming alloys is present. Most alloys will ignite if the particles are 200 mesh and down. Class 2 (actively combustible) will ignite at 100 mesh and down. Class 1 (highly combustible) will ignite at 8 mesh and down. Titanium metal will ignite in the lump size under great shock and will resist all the usual methods of extinguishing the combustion.

Certain alloys will yield combustible and toxic gases on exposure to a mist atmosphere at room temperature. Ferrosilicon and calcium-manganese-silicon will yield hydrogen and phosphine gas. Calcium silicon produces hydrogen, silane, and phosphine gases. Low-iron ferromanganese will spontaneously break down to manganese carbide, which will produce acetylene gas. Aluminum carbide will produce methane gas. Magnesium-calcium-silicon produces hydrogen and silane gases on contact with acids. Barium silicon produces hydrogen and silane gases on contact with acids. Barium silicon produces silane and hydrogen gas on exposure to air, and occasionally acetylene gas.

Nitride and boron alloys are generally inert and nontoxic, presenting no significant health hazard. Carbides of aluminum, boron, chromium, tantalum and titanium have not produced pulmonary damage or pneumoconiosis. Tungsten carbide is only a suspected agent in pulmonary irritation, but vanadium carbide is a definite (though mild) pulmonary irritant, and prolonged exposure could possibly produce permanent pulmonary damage. Chromium alloys are nontoxic and have not produced any skin reactions or pulmonary changes, nor have produced an increased incidence of pulmonary cancer. The crushing operations and production of manganese alloys have not produced any significant cases of central nervous system damage in the ferroalloy industry in the United States. Molybdenum, tungsten, titanium, and tantalum alloys are harmless.

Alloys of silicon metal do not produce silicosis. The fumes, which are evolved in great quantity in

the furnace production of ferrosilicon, is a questionable cause of silicosis. Vanadium alloys will produce upper respiratory and bronchial irritation, and columbium has a slight tendency in this direction. Allergic reaction of the skin and respiratory tract to most metals and alloys is uncommon. Cobalt and nickel occasionally may cause an allergic dermatitis or bronchial asthma.

lergic reaction of the skin and respiratory tract to most metals and alloys is uncommon. Cobalt and nickel occasionally may cause an allergic dermatitis or bronchial asthma.

## MISCELLANY

### JOINT MEETING BETWEEN BROOKLYN SURGICAL SOCIETY AND STAFF OF THE U. S. NAVAL HOSPITAL, ST. ALBANS, N. Y.

The annual Spring scientific meeting between the Brooklyn Surgical Society and the staff of the U.S. Naval Hospital, St. Albans, New York, was held on Thursday, 1 April 1965, at State University of New York Downstate Medical Center. Papers were presented by members of the host society and discussed by members of the staff of the U. S. Naval Hospital, St. Albans, N. Y. The program was as follows:

#### "Experimental Transplantation of an Auxiliary Liver"—

Marvin L. Gliedman, MD

Associate Professor of Surgery

Discussor: Charles B. Volcjak, LT MC USN—  
Surgical Service

#### "Electrical Pacing of the Heart"—

Karl E. Karlson, MD

Professor of Surgery and Head of  
Thoracic Surgery

Discussor: Homer S. Arnold, CDR MC USN  
Head of Thoracic Surgery

#### "Fracture Healing In Experimental Diabetes"—

Horace Herbsman, MD

Instructor in Surgery

Discussor: Charles H. Emich, LCDR MC USN  
Orthopedic Service

#### "Basic Studies on Massive Gastroduodenal Hemorrhage"—

Irving F. Enquist, MD

Professor of Surgery

Discussor: William R. Blakeley, LCDR MC  
USNR Surgical Service

The professional program was followed by a social hour and the Forty-First Annual Invitation

Dinner in honor of the staff of the U. S. Naval Hospital, St. Albans, which was held at the Hotel Granada, in Brooklyn.

Seated on the dais with Dr. Clarence Dennis, President of the Brooklyn Surgical Society, were other officers of the host society, senior officers of the St. Albans Naval Hospital staff and presidents of the several surgical societies in the Brooklyn-Queens-Long Island area. The featured speaker at the dinner was Dr. David Dingman, currently a surgical resident at the University of Maryland. Dr. Dingman spoke on his experiences as a member of the successful United States assault on Mt. Everest in 1963.

The close and friendly association with the Brooklyn Surgical Society, which is one of the oldest surgical societies in the Nation, dates back to 1924 when the first meeting was held between this Society and the Staff of the U. S. Naval Hospital, Brooklyn, New York. Since that time, reciprocal meetings have been held each year except for an interruption during World War II. Each year, the Spring meeting is hosted by the Brooklyn Surgical Society and the winter meeting by the U. S. Naval Hospital staff. In recent years, the Naval Hospital at St. Albans replaced the Hospital at Brooklyn as the participant in these joint meetings.—Commanding Officer, U.S. Naval Hospital, St. Albans, New York.

### SAB, BOARD OF GOVERNORS MEET AT AFIP

The Armed Forces Institute of Pathology Board of Governors and the Scientific Advisory Board both met at the Institute recently.

RADM Robert B. Brown, MC USN, the new Surgeon General of the Navy, attended his first meeting as a member of the Board of Governors. RADM Brown succeeded retired Surgeon General RADM E. C. Kenney on the Board.

A certificate of appreciation for RADM Kenney's outstanding support and loyalty to the AFIP while serving as a member of the Board of Governors was presented to the retiring Surgeon General by AFIP Director Brig Gen Joe M. Blumberg. The citation was presented in the Surgeon General's office in a special ceremony also attended by RADM Brown and AFIP Deputy Directors CAPT Bruce H. Smith, Jr., and LT COL David Auld.

At the meeting of the Scientific Advisory Board of Consultants, Dr. Howard T. Karsner, a pioneer in pathology and longtime friend of the AFIP, was named an honorary lifetime member of the Board. A certificate to be presented to Dr. Karsner stated: "For a lifetime of loyal and dedicated service to the Armed Forces Institute of Pathology (Howard T. Karsner) is hereby named honorary life member of the Scientific Advisory Board." The citation will be presented to Dr. Karsner by The Director.—AFIP Letter, Apr 1965.

#### DIRECTORY OF POISON CONTROL CENTERS

A newly revised directory of the 545 poison control centers now operating in the United States and possessions was issued by the Public Health Service's Division of Accident Prevention, U. S. Department of Health, Education, and Welfare. The revised directory, Public Health Service Publication No. 1278, replaces the directory published in August, 1962.

The new "Directory of Poison Control Centers," compiled from information furnished to the National Clearinghouse for Poison Control Centers by State health departments, lists the address, telephone number and directing personnel of poison control centers functioning in 469 cities in 48 States, and in the Canal Zone, District of Columbia, Guam, Puerto Rico and the Virgin Islands.

The centers listed in the directory function independently within State poison control programs. They are supported with information and technical data services by the National Clearinghouse for Poison Control Centers, operated by the Poison Control Branch of the Division of Accident Prevention.

The new directory includes centers which provide round-the-clock information services for the medical profession concerning the prevention and treatment of accidents involving ingestion of poisonous and potentially poisonous substances. It is available for 20 cents from the Superintendent of Documents,

Government Printing Office, Washington, D. C. 20402.—USDHEW, Public Health Service.

#### CONSTRUCTION GRANTS AWARDED

Three new medical schools are being awarded construction grants totaling \$25,321,347, Secretary of Health, Education, and Welfare Anthony J. Celebrezze announced.

The grants are being made to the University of Texas for the South Texas Medical School and an affiliated teaching hospital, Bexar County Hospital, both to be located in San Antonio; to Rutgers University for a School of Medicine, in New Brunswick, N. J.; and to the University of California for a School of Medicine, in San Diego.

With the award of these grants, 33 projects have thus far been aided, in the amount of \$77,188,797, under provisions of the Health Professions Educational Assistance Act of 1963. The Public Health Service is responsible for administering the Act which provides grants to stimulate construction of additional educational facilities for those health professions which are experiencing serious manpower shortages.

The awards related to the new South Texas Medical School total \$12,948,581, with \$3,948,581 for the medical school and \$9,000,000 for the 13-story teaching hospital which will have 476 beds. The medical school plans to provide spaces for an entering class of 100 students.

Rutgers University, which will receive \$4,337,519, is planning to construct a two-year medical school which will accommodate 64 students in 1966 and 80 in 1971.

The new University of California School of Medicine, which is being aided in the amount of \$8,035,247, will be a 5-story structure and will be one of 13 separate colleges to be located on the new San Diego campus.

The grants were made on the recommendation of the National Advisory Council on Education for Health Professions. Council members represent the general public as well as each of the health professions authorized to receive aid under the Act.—USDHEW, Public Health Service.

#### 1943 WAVE RECRUIT RECALLS 22 YEARS SERVICE WITH NAVY

*By Byron S. Whitehead, JO2*

In the summer of 1943, shortly after the WAVES were organized, eighteen young women wearing Navy Blues arrived for duty at a San Francisco naval



communications station where the skipper refused to accept them because he had never heard of such a thing as "women in the Navy."

A phone call to the Treasure Island Naval Base soon cleared the way for the girls' assignment, and eventually, 26 sailors were freed from shore duty tasks and transferred to sea.

For one WAVE recruit this episode was the first of many during 22 years with the Navy.

Today, that same girl, Katherine Keating, is a commander in the Medical Service Corps, assigned as Chief of Pharmacy Service at the U. S. Naval Hospital, Yokosuka, Japan.

Born in Pueblo, Colorado, she is the daughter of Mrs. Cecil Keating. Her first contact with the Navy began at the University of Colorado in December, 1942, while she was a student.

"I had read in the papers that a U. S. Navy recruiting van would pass near our university to enlist women. Patriotism was so high at this time that enlisting seemed like the only thing to do," said Miss Keating.

Miss Keating received her recruit training at Hunter College, New York.

"I was looking forward to better things in the Navy but found myself peeling potatoes eight hours a day for the first three weeks. Can you imagine how many potatoes it takes to feed 2,000 girls?" she asked.

"Its funny," she said, "we didn't get our uniforms until three days before graduation, and on that day we paraded for the visiting Madame Chiang Kai-Shek."

Upon graduation from recruit training she had her choice of four rates to enter. The four rates were yeoman, radioman, storekeeper, and aerographer.

"If you could tell the difference between a dot and a dash you were assigned to radio school," she noted.

Of the first, 2,000 enlisted WAVES to enter the Navy, 400 were transferred to the Radio School at the University of Wisconsin, including seaman apprentice Keating.

After 19 weeks of radio training, she was advanced to third class radioman and received her first set of orders.

With 17 other WAVES she headed for San Francisco. It was here she met the skipper who didn't want women and sent them packing to Treasure Island.

At Treasure Island no accommodations were available for women.

"The commanding officer had the top deck of the Armed Guard Barracks cleared and bunks put in for us. A guard was posted at the foot of the steps leading up to our room. The big joke then was who was going to watch the guard," she said.

One foggy night while assigned to the distress frequency radio control section on Treasure Island, she received an SOS from the liberty ship SS Henry Bergh. The Bergh, returning to the U. S. with WW II casualties, had run aground on rocks about 25 miles out of San Francisco. Miss Keating immediately informed search and rescue units, giving them the ship's position, thereby making it possible for them to rescue all patients and crew aboard the ship.

For this action, the WAVES received special notice from other naval commands and suddenly WAVE radiomen were in great demand.

After a year at Treasure Island she volunteered for duty in Hawaii.

"I'll never forget it," she says, "I boarded a troop transport along with 200 other WAVES. The nine-day trip to Hawaii was a rough experience. I was the world's most seasick person. We were berthed in a compartment with bunks five high. I had the bottom bunk. When the girl in the fifth rack got sick, I got the worst of it."

En route to Hawaii the WAVES stood watches in the radio control room.

"The chief petty officer felt sorry for me and placed a bucket at my feet so I could work and get sick at the same time," she said.

With the arrival of the WAVES in Hawaii, sailors at the Wahiawa Communications Station were able to go off port and starboard duty and onto three-section watches because of the WAVES assistance.

At Wahiawa she was advanced to radioman first class. With the war in the Pacific over, she was discharged and reentered the University of Colorado where she attained a B. S. Degree in Pharmacy. At the same time she entered the Reserves.

After graduation, she returned to active duty as an RM2.

With her degree in pharmacy, RM2 Keating hoped to switch to the hospital corps rate but the Navy kept her in radio work.

Her first assignment after re-enlisting was at Naval Air Station, Seattle, Wash., where she was the only WAVE radioman in the Thirteenth Naval District.

Miss Keating's assignment to an all male crew presented a problem for the Communications Officer. Since the latter was an aviator, he used her as his radioman on aircraft flights.

From Seattle it was back to Treasure Island again where she worked on the staff of Commander, Western Sea Frontier. Here, she was again advanced to RM1.

At this time a critical shortage in hospital corpsmen arose and Miss Keating was authorized to change her rate to HM1.

Two months later she was advanced to the rank of ensign.

Although most new ensigns are trained at Officer Candidate School, Ensign Keating was ordered instead to the Naval Air Station, San Diego.

"It was in San Diego that I got my baptism of fire as the original ensign with two left feet. There never had been a Pharmacy Officer there before, let alone a female," says Miss Keating.

In December, 1953, Miss Keating reported aboard the U. S. Navy hospital ship Haven at Long Beach which promptly deployed to the Korean conflict area. The Haven remained in Korean waters until completion of prisoner-of-war exchanges.

From Korea, while still aboard the Haven, she went to Saigon to assist in evacuating French Foreign Legion survivors from Dhien Bien Phu.

En route to Algeria the ship celebrated its equator crossing.

In addition to the Golden Dragon, she holds Shellback and Magellan certificates.

From 1955 to 1964, Miss Keating served in naval hospitals at Mare Island, Oakland, and Memphis.

In January, 1964, she became officer-in-charge of the Pharmacy Technicians School at San Diego. Seven months later she accepted orders to the U.S. Naval Hospital, Yokosuka, and was advanced to the rank of Commander on 1 Dec. 1964.

Looking to the future, she says she may stay with the Navy or practice hospital pharmacy in Oakland, California.

"I have already passed the California State Board of Pharmacy examination," she reports.

Commander Keating is not the only member of her family in the service. One brother, TSgt. John F.

Keating, is stationed with the Air Force at Yokota, Japan.

Does Commander Keating think other women should consider serving with the Navy?

"A career in the Navy," she claims, "can be a very exciting and rewarding experience but should not be undertaken by any individual who lacks a real desire to serve her country."

#### ANNIVERSARY GREETINGS TO NURSE CORPS OFFICERS

On this memorable occasion, the fifty-seventh anniversary of the Navy Nurse Corps, I welcome the opportunity to extend greetings and best wishes. Despite the stress and strain of daily activities, may this special day bring a measure of true satisfaction to each of you.

Significantly, this year commemorates the 20th anniversary of the cessation of World War II. It seems appropriate that we dedicate our anniversary to the Nurse Corps officers who served in the Corps during the period 7 December 1941 through the date of the truce, September, 1945. I know that you will join me in expressing our tribute and appreciation to all the 11,500 nurses who served during that crucial war era.

History has recorded the deeds, heroism, and personal sacrifices of these nurses. They brought expert nursing care, comfort and cheer to thousands of patients at home, overseas, in the air, and aboard ship. Individually, and as a Corps, they served over and beyond all expectation. Day by day, month by month, and year by year they adapted to changing medical practice and brought improved methods of administration and nursing to their units. All deserve our thanks for the progressive advancements made during their tenure.

Additionally, these nurses shared in the hardships and tragedies brought about by war. The entire Corps expressed sympathy and personal concern for their courageous nurse colleagues who were captured on Guam and the Philippine Islands and who became prisoners of war. The *esprit de corps* was again evident, however, as we rejoiced with the news of their release.

In retrospect, the members of the Nurse Corps rejoiced in the triumphs and honors accorded their fellow officers. There was expressed pride in the knowledge that nurses were aboard three hospital ships of

the Third Fleet as the surrender was signed on the USS MISSOURI in Tokyo Bay, September, 1945. Soon thereafter, honors and commendations were awarded to nurses for their outstanding performances. The Distinguished Service Medal was awarded to CAPT Sue Dauser, NC USN (ret), Director of the Navy Nurse Corps. CDR Ann A. Bernaitus, NC USN (ret) received the Legion of Merit. Fourteen Nurses received the Bronze Star Medal. CAPT C. Edwina Todd, NC USN, Chief of Nursing Service at the U. S. Naval Hospital, Portsmouth, Virginia was a recipient of the Bronze Star Medal. Over 250 additional nurses received commendations.

We all realize that these achievements and events represent only a sampling of the notable efforts of the Nurse Corps officers who served during World War II. We are profoundly proud of them and salute these officers on the fifty-seventh anniversary of the Navy Nurse Corps.

I am equally proud of the members of the Corps today. Many of you entered the ranks in recent years. You serve with nurses who entered the Navy prior to Pearl Harbor, as well as with those who volunteered during World War II. All of you continue to serve with dedication and purpose that are traditional ideals of the Naval Service. You have an illustrious heritage and are worthy successors.

My warmest personal regards and congratulations to each.

HAPPY ANNIVERSARY  
S/ Ruth A. Erickson  
CAPT, NC, USN  
Director, Navy Nurse Corps

#### TO THE OFFICERS OF THE NAVY NURSE CORPS

On the occasion of your Corps' fifty-seventh anniversary, I extend my sincere congratulations to all of you.

Since the establishment of the Navy Nurse Corps on May 13, 1908, your record of achievement and professional progress has been viewed with pride by all members of the Medical Department. Your devotion to duty, proficiency, and ability to adapt to changing needs of service and professional trends has contributed immeasurably in the accomplishment of our mission.

May you continue to serve so capably and diligently in the challenging decade ahead and may the succeeding years be rewarding ones for you.



R. B. BROWN  
Rear Admiral, MC, USN  
Surgeon General

WASHINGTON, D.C.  
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ASSIST. FOR MED. & ALLIED SCIENCES  
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